Sem	Course Code	Core 1 : Professional English - I	Total Marks: 100		Hours Per Week	Credits
I	21UAMCT101		CIA: 50	ESE: 50	4	4

Course Objectives:

1. To develop the language skills of students.
2. To enhance the lexical, grammatical, socio-linguistic and communicative competence.
3. To focus on developing students' knowledge in domain specific registers and the required language skills.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Identify the correct usage of vocabulary and grammar in speaking and writing.	
CO 2	Apply the language for speaking efficiently and confidently.	
CO 3	Build the reading skill by using unfamiliar texts with comprehension.	K1 - K4
CO 4	Demonstrate the language skills through academic writing.	
CO 5	Develop the leadership quality and team building through linguistic competence.	

K1: Remember; K2: Understand; K3: Apply; K4: Analyze

Unit - I	Communication

Listening: Listening to audio text and answering questions - Listening to Instructions.

Speaking: Pair work and small group work.

Reading: Comprehension passages - Differentiate between facts and opinion.

Writing: Developing a story with pictures.

Vocabulary: Register specific - Incorporated into the LSRW tasks.

Unit - II	Description

Listening: Listening to process description - Drawing a flow chart.

Speaking: Role play (formal context).

Reading: Skimming/Scanning - Reading passages on products, equipment and gadgets.

Writing: Process Description - Compare and Contrast Paragraph - Sentence Definition and extended definition - Free Writing.

Vocabulary: Register specific - Incorporated into the LSRW tasks.

Unit - III	Negotiation Strategies

Listening: Listening to interviews of specialists / Inventors in fields (Subject Specific).

Speaking: Brainstorming (Mind Mapping) - Small group discussions (Subject Specific).

Reading: Longer Reading text.

Writing: Essay Writing (250 words).

Vocabulary: Register specific - Incorporated into the LSRW tasks.

Unit - IV	Presentation Skills

Listening: Listening to lectures.

Speaking: Short talks.

Reading: Reading Comprehension passages.

Writing: Writing Recommendations - Interpreting Visuals inputs.

Vocabulary: Register specific - Incorporated into the LSRW tasks.

Unit - V	Critical Thinking Skills

Listening: Listening comprehension - Listening for information.

Speaking: Making presentations (with PPT-practice).

Reading: Comprehension passages - Note making. (Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills).

Writing: Problem and Solution essay - Creative writing - Summary writing.

Vocabulary: Register specific - Incorporated into the LSRW tasks.

Skill Development Activities

1.	Listening and Answering
2.	Speaking Activities through Role Play
3.	Reading and Answering
4.	Resume Preparation
5.	Vocabulary Enhancement Activities – Definitions, Synonyms, Antonyms, Keywords etc..,

TEXT BOOK

Professional English for Physical Sciences-I - TANSCHE.

REFERENCE BOOKS

Simon Sweeney, English for Business Communication, Student's Book, Second Edition, Cambridge University Press, 2003.
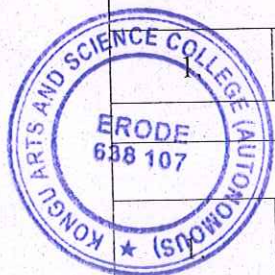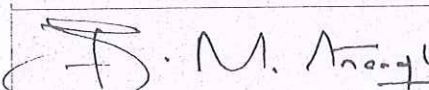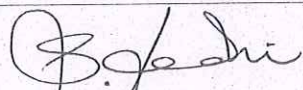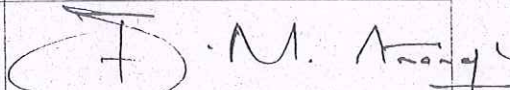
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(AUTONOMOUS)
NANJANAPURAM, ERODE - 638 107.

2.	Michael McCarthy, Felicity O'Dell, English Vocabulary in Use: Advanced, First South Asian Edition, Cambridge University Press, 2003.

WEB RESOURCES

| 1.	https://nptel.ac.in/courses/109/104/109104030/
2.	https://www.edubull.com/courses/online-english-speaking-courses-video-english/tofel-ilets/basic-courses/professional-english-part-2

Course Designed By	Verified By	Approved By HOD
(Mr. S.Muruganantham)	(Ms. S.Yasmin)	(Mr. S.Muruganantham)

QUESTION PAPER PATTERN

SECTION - A (10 X 1 = 10 Marks)	SECTION - B (4 X 10 = 40 Marks)
(Vocabulary) (MCQ, Info-gap questions - domain specific vocabulary)	(Reading: Two long domain-specific comprehension passages with questions pertaining to understanding and analysis - 20 Marks) (Writing: Descriptive/narrative/persuasive writing questions pertaining to domain-specific vocabulary - 20 Marks)

Mapping of COs with POs and PSOs

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	S	S	S	S	M	M	S	M	M	S	S
CO 2	S	S	S	S	S	M	M	S	S	M	S	M
CO 3	S	S	M	M	M	M	S	S	S	M	S	M
CO 4	S	M	M	M	M	M	S	S	M	S	M
CO 5		S	S	M	S	S	S	S		M		S
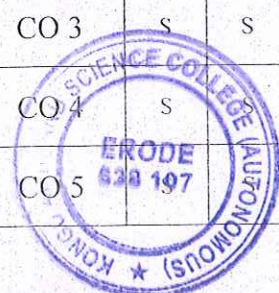
S-Strong, M-Medium, L-Low

Sem	Course Code	Core 2: Programming with C and C++	Total Marks: 100		Hours Per Week	Credits
I	21UAMCT102		CIA: 50	ESE: 50	4	4

Course Objectives:

1. To develop programming skills to design and implement C / C++ programs.
2. To impart the knowledge of functions for modular programming and pointers for memory handling.
3. To demonstrate the object oriented programming usage of class and objects, encapsulation and inheritance.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Demonstrate simple applications in C using basic constructs.	
CO 2	Illustrate the concepts of arrays, string, functions, recursions, structures and unions.	
CO 3	Develop C program using pointers and file management.	K1 - K4
CO 4	Summarize the concept of classes, objects, constructors and destructors in C++.	
CO 5	Apply the operator overloading, inheritance and exception handling concepts to solve the real-world problems.	

K1: Remember; K2: Understand; K3: Apply; K4: Analyze

Unit - I	**Basics of C Programming**

Overview of C: History of C - Importance of C - Basic Structure of C Programs - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables - Assigning Values to Variables - Operators and Expressions - Formatted I/O (scanf(), printf()) - **Decision Making and Branching :** Simple If Statement - The If...Else Statement - Nesting of If..Else Statements - The Switch Statement - The ?: Operator - The goto Statement -**Decision Making and Looping :** The While Statement - The do Statement - The for Statement.

Unit - II	**Arrays, Strings and Structures**

Arrays: One-Dimensional Arrays - Declaration and Initialization of One-Dimensional Arrays - Two-Dimensional Arrays - Initializing Two-Dimensional Arrays - Multi-Dimensional Arrays - **Character Arrays and Strings:** Declaring and Initializing String Variables - String-Handling Functions - **User Defined Functions:** Definition of Functions - Return Values and Their Types -

Function Calls - Function Declaration - Category of Functions - Recursion - **Structures and Unions:** Defining a Structure - Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Arrays of Structures - Structures within Structures - Structures and Functions - Unions.

Unit - III	Pointers and File Processing

Pointers: Introduction - Declaring Pointer Variables - Initialization of Pointer Variables - Chain of Pointers - Pointer Expressions - Pointers and Arrays - Pointer as Function Arguments - Pointers to Functions - Pointers and Structures - **File Management in C:** Defining and Opening a File - Closing a File - Input/Output Operations on Files - Command Line Arguments.

Unit - IV	Object Oriented Programming Concepts

Introduction: Basic Concepts of Object Oriented Programming - **Classes and Objects:** Specifying a Class - Defining a Member Functions - Function Overloading - Friendly Functions - **Constructors and Destructors:** Constructors - Parameterized Constructors - Constructors with Default Arguments - Copy Constructor - Destructors.

Unit - V	Operator Overloading, Inheritance and Exception Handling

Operator Overloading and Type Conversions: Defining Operator Overloading - Overloading Unary Operators - Overloading Binary Operators - Rules for Overloading Operators - Type Conversions - **Inheritance:** Single Inheritance - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance - Virtual Base Classes - Abstract Classes - **Exception Handling:** Exception Handling Mechanism - Throwing and Catching Mechanism.

Skill Development Activities

1.	Implement Gauss Seidel Iterative method.
2.	Design simple text editor.
3.	Develop an application for car animation.
4.	Create header file.
5.	Create payroll processing system application.

TEXT BOOKS

E.Balagurusamy, Programming in ANSI C, Sixth Edition, Tata McGraw Hill Education, Third Reprint 2012 [UNIT I, II & III].

E. Balagurusamy, Object Oriented Programming with C++, 6th Edition, McGraw Hill Education, 2013 [UNIT IV & V].

REFERENCE BOOKS

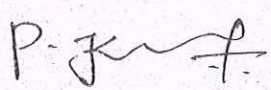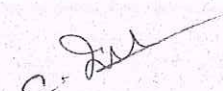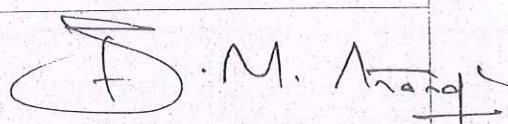|	
1.	Ashok N. Kamthane, Programming with ANSI and Turbo C, 1st Edition, Pearson Education, New Delhi, 2004.
2.	Herbert Schildt, The Complete Reference C++, 4th Edition, Paperback, 2003.

WEB RESOURCES

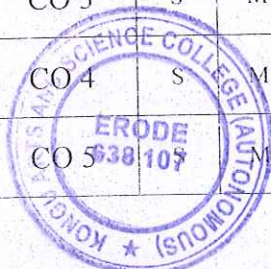|	
1.	https://spoken-tutorial.org/watch/C+and+Cpp/First+C+Program/English/
2.	https://www.tutorialspoint.com/cplusplus/index.html

Course Designed By	Verified By	Approved By HOD
(Dr. P.Kalarani)	(Ms. C.Indrani)	(Mr. S.Muruganantham)

QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	5 x 3 = 15 Marks	5 x 5 = 25 Marks
Answer ALL questions	Answer ALL questions	Answer ALL questions
Choose the correct answer	Either or type	Either or type
Two questions from each unit	Two questions from each unit	Two questions from each unit

Mapping of COs with POs and PSOs

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	M	S	M	M	M	S	S	S	M	S	M
CO 2	S	M	S	M	M	M	S	S	S	M	M	S
CO 3	S	M	S	M	M	M	S	S	S	M	M	S
CO 4	S	M	S	S	S	S	M	S	S	M	M	S
CO 5	S	M	S	S	S	S	M	S	S	M	M	S

S-Strong, M-Medium, L-Low

Sem	Course Code	Core Practical 1: C and C++ Programming Lab	Total Marks: 100		Hours Per Week	Credits
I	21UAMCP103		CIA : 50	ESE : 50	3	3

Course Objectives:

1. To enable the students to enhance their analyzing and problem solving skills for writing programs in C.
2. To practice the basic concepts, branching and looping statements and strings in C.
3. To impart the knowledge of object oriented programming paradigm.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Apply the concepts of operators and expressions.	
CO 2	Implement the branching and looping statements, arrays, strings and structures.	
CO 3	Demonstrate the concepts of pointers and file management.	K1 - K4
CO 4	Develop programs with class and objects, constructors and destructors.	
CO 5	Apply the process of inheritance and exception handling mechanism.	

**K1: Remember; K2: Understand; K3: Apply; K4: Analyze**

Programs

1. Write a C program to find the sum, average and standard deviation for a given set of numbers.

2. Write a C program to print a diamond pattern of stars as follows (take number of rows from user)

```
             *
          *  *  *
       *  *  *  *  *
    *  *  *  *  *  *  *
       *  *  *  *  *
          *  *  *
             *
```
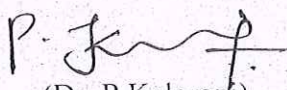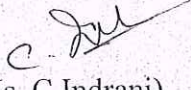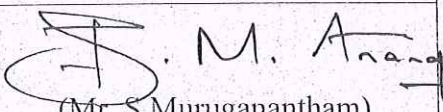
3. Write a C Program to perform matrix addition using two-dimensional array.

4. Write a C Program to create a structure Student containing fields for Roll No, Name and Marks in five subjects. Create an array of structures and print the mark sheet.
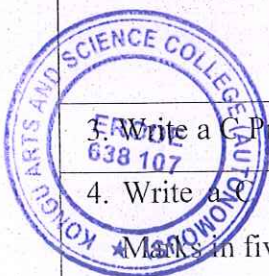
5. Write a C program that swaps two numbers using pointers.

6. Write a C program to merge two files into third file.

7. Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write a member function ADD(), SUB(), MUL() and DIV() to perform addition, subtraction, multiplication and division respectively. Write a member function to get and display values.

8. Write a C++ Program to create two classes each class consists of two private variables, an integer and a float variable. Write member functions to get and display them. Write a FRIEND function common to both the classes, which takes the object of the above two classes as arguments and the integer and float values of both objects separately and display the result.

9. Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the object FLOAT.

10. Write a C++ Program to create class, which consists of EMPLOYEE details like E_Number, E_Name, Department, Basic_Salary and Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

Course Designed By	Verified By	Approved By HOD
P. Kanmani (signature)	C. (signature)	S. M. Anand (signature)
(Dr. P.Kalarani)	(Ms. C.Indrani)	(Mr. S.Muruganantham)

Mapping of COs with POs and PSOs

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	M	S	M	M	M	S	S	S	M	S	M
CO 2	S	M	S	M	M	M	S	S	S	M	M	S
CO 3	S	M	S	M	M	M	S	S	S	M	M	S
CO 4	S	M	S	S	S	S	M	S	S	M	M	S
CO 5	S	M	S	S	S	S	M	S	S	M	M	S

S-Strong, M-Medium, L-Low

Sem	Course code	ALLIED COURSE –I	Total Marks:100		Hours Per Week	Credits
I	21UAMAT104	NUMERICAL AND STATISTICAL METHODS	CIA: 50	ESE:50	5	4

Course Objectives:

1. To understand the concepts of numerical methods for Computer Science
2. Make the Students to be ready for solving Statistical Problems
3. To impart knowledge among the students for solving problems through Numerical methods

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Solve Linear algebraic equations.	K1-K4
CO 2	Apply Newton's Interpolation Formulae.	K1-K4
CO 3	Calculate Measures of Central Tendency and Dispersion.	K1-K4
CO 4	To gain Knowledge in Correlation	K1-K4
CO 5	Analyse the Problems using Regression.	K1-K4

K1 :Recall; K2 :Understand; K3 :Apply; K4 :Analyze; K5: Evaluate; K6: Create.

Unit –I :	**Numerical Solution of Equations**

The Solution of Numerical Algebraic and Transcendental Equations: The Bisection method –

Regula Falsi Method – Newton - Raphson method.

Solution of Simultaneous Linear Algebraic Equations :Gauss-Elimination Method and Gauss-Seidel

Method of Iteration

Chapters 3 (Pg.No.:69-75, 81-98)

Chapters 4 (Pg.No.: 112-121, 147-159)

Unit – II :	**Interpolation**

Interpolation: Newton's Forward and Backward interpolation formulae.

Numerical Differentiation: Newton's Forward Difference – Newton's Backward Difference.

Numerical Integration: The Trapezoidal Rule – Simpson's one-third Rule.

Chapter 6 (Section 6.2,6.3) (Pg.No.:211-227)

Chapter 9 (Sections 9.2, 9.3, 9.9, 9.11, 9.13, 9.16)(Pg.No.: 281-288, 300-304, 306-313)

Unit – III :	**Measures of Central Tendency and Dispersion**

Measures of Central Tendency: Mean, Median and Mode.

Measures of Dispersion: Range- Quartile Deviation - Standard Deviation – Coefficient of Variation.

Chapter 7 (Pg.No.: 159-183, 196-209, 212-227)

Chapter 8 (Pg.No.: 305-311, 325-340, 360-362)
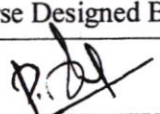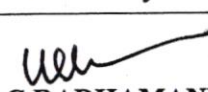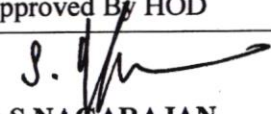
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Unit – IV :	Correlation

Simple Linear Correlation – Scatter Diagram – Karl Pearson's Coefficients of Correlation –Spearman's Rank Correlation Coefficient.

Chapter 12 (Pg.No.: 503-528)

Unit – V :	Regression

Simple Linear Regression– Difference between Correlation and Regression–Two Regression Lines– Methods of forming the Regression Equations- Properties of Regression lines and Coefficients.

Chapter 13 (Pg.No.: 540-554,563-569)

Skill Development Activities

1. List out and explain the real life applications of Numerical Methods.
2. Correlate your first and second internal marks.
3. List out and explain the applications of Statistics in the field of Computer Science.

TEXT BOOKS	
1	Dr. P.Kandasamy, Dr.K.Thilagavathy and Dr.K.Gunavathi,"Numerical Methods", S.Chand and company ltd, 2016.
2	P.A. Navnitham, "Business Mathematics & Statistics", Jai Publishers, 2011.

REFERENCE BOOKS	
1	E. Balagurusamy," Numerical methods", Tata MC Graw Hill Publishing Company Ltd,2008.
2	S.C Gupta, V.K.Kapoor,"Fundamental of Mathematical statistics", Sultan Chand and Sons, 2008.
3	Richard W.Hamming, "Numerical Methods for Scientists and Engineers", Dover Publications Inc., 1987.
4	R.S.N.Pillai & Bagavathi, "Statistics", Sultan Chand &Co, 2010.
5	S.P. Gupta, "Statistical Methods", Sultan Chand &Sons, 2012.

Web Resources	
1	https://lecturenotes.in/m/17447-note-of-numerical-analysis-and-statistics-method-by-chirag-damania
2	https://go-pdf.online/out/53109AD/notes-numerical-and-statistical-methods-for-bca.pdf

Course Designed By	Verified By	Approved By HOD
Ms.P.KIRUTHIKA	Ms.C.RADHAMANI	Dr.S.NAGARAJAN

Sem	Course Code	Core 3 : Professional English - II	Total Marks: 100		Hours Per Week	Credits
II	21UAMCT201		CIA: 50	ESE: 50	4	4

Course Objectives:

1. To develop their competence in the use of English with particular reference to the workplace situation.

2. To enhance the creativity of the students which will enable them to think of innovative ways to solve issues in the workplace.

3. To develop their competence and competitiveness and thereby improve their employability skills.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Identify the importance of linguistic competence in workplace situations	
CO 2	Develop LSRW skills for academic and career purposes	
CO 3	Build the employability skills through various speaking and writing tasks	K1 - K4
CO 4	Relate the communication skills suitable for employability	
CO 5	Illustrate the digital competence with innovation and imagination	

K1: Remember; K2: Understand; K3: Apply; K4: Analyze

Unit - I	**Communicative Competence**

Listening: Listening to two talks/lectures by specialists on selected subject specific topics - (TED Talks) and answering comprehension exercises (inferential questions).

Speaking: Small group discussions (the discussions could be based on the listening and reading passages - open ended questions).

Reading: Two subject-based reading texts followed by comprehension activities/exercises.

Writing: Summary writing based on the reading passages.

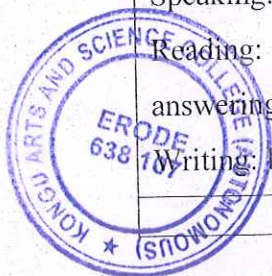| Unit - II	**Persuasive Communication**

Listening: Listening to a product launch- sensitizing learners to the nuances of persuasive communication.

Speaking: Debates - Just-A Minute Activities

Reading: Reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions.

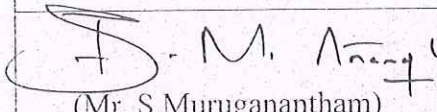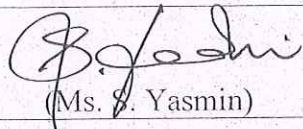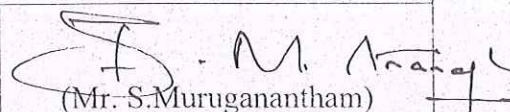Writing: Dialogue writing- Writing an argumentative / persuasive essay.

Unit - III	Digital Competence

Listening: Listening to interviews (subject related).

Speaking: Interviews with subject specialists (using video conferencing skills) - Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related).

Reading: Selected sample of Web Page (subject area).

Writing: Creating Web Pages.

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life. The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area.

Unit - IV	Creativity and Imagination

Listening: Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites - E.g. https://www.youtube.com/watch?v=tpvicScuDy0).

Speaking: Making oral presentations through short films - subject based.

Reading: Essay on Creativity and Imagination (subject based).

Writing - Basic Script Writing for short films (subject based) - Creating blogs, flyers and brochures (subject based) - Poster making - writing slogans/captions (subject based).

Unit - V	Workplace Communication and Basics of Academic Writing

Speaking: Short academic presentation using PowerPoint.

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, Paraphrasing, Punctuation (period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis), Capitalization (use of upper case).

Skill Development Activities

1.	Group Discussion
2.	Persuasive Speaking - Conversation
3.	Listening Activities – Watching Videos and answering questions and summarizing the content
4.	Creative Writing – Flyers, Brochures, Slogans, Captions
	Powerpoint Presentation

TEXT BOOK
Professional English for Physical Sciences-II - TANSCHE.

Dr. N. RAMAN
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KONGU ARTS AND SCIENCE COLLEGE
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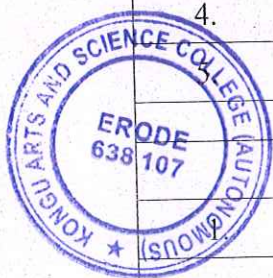
REFERENCE BOOKS

1.	Alice Oshima & Ann Hogue, Writing Academic English, Second Edition, Addison Wesley Publishing Company, 1991.
2.	Lyn R. Clark, Kenneth Zimmer, Joseph Tinervia, Business English and Communication, Seventh Edition, MacMillan / McGraw-Hill, Imprint 1991.

WEB RESOURCES

1.	https://www.coursera.org/learn/speak-english-professionally
2.	https://www.ted.com/talks/pranav_rajan_computer_science_education

Course Designed By	Verified By	Approved By HOD
(Mr. S.Muruganantham)	(Ms. S. Yasmin)	(Mr. S.Muruganantham)

QUESTION PAPER PATTERN

SECTION - A (10 X 1 = 10 Marks)	SECTION - B (4 X 10 = 40 Marks)
(Vocabulary) (MCQ, Info-gap questions - domain specific vocabulary)	(Reading: Two long domain-specific comprehension passages with questions pertaining to understanding and analysis - 20 Marks) (Writing: Descriptive/narrative/persuasive writing questions pertaining to domain-specific vocabulary - 20 Marks)

Mapping of COs with POs and PSOs

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	S	S	M	S	M	M	S	S	M	S	M
CO 2	S	S	M	S	M	M	S	S	S	M	S	S
CO 3	S	S	S	M	S	M	S	S	S	M	S	S
CO 4	S	S	M	S	S	M	S	S	S	M	S	S
CO 5	S	S		M	M	M	M	S	S		M	M
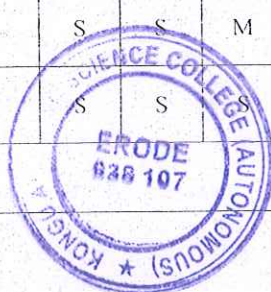
S-Strong, M-Medium, L-Low

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Sem	Course Code	Core 4: Database Management Systems	Total Marks: 100		Hours Per Week	Credits
II	21UAMCT202		CIA: 50	ESE: 50	4	4

Course Objectives:

1. To provide the knowledge about the database, Structured Query Language (SQL) and entity relationship model of data.
2. To learn the basics of functional dependency, normalization, database recovery and database security.
3. To gain employability opportunities in the design and implementation of a database system project.

Course Outcomes (CO) : On completion of the course, students should be able to

CO 1	Demonstrate the understanding of database systems and their architectures.	
CO 2	Illustrate the concept of relational algebra, calculus and relational query language.	
CO 3	Summarize the concepts of Entity Relationship Model and Enhanced Entity Relationship Model.	K1 - K4
CO 4	Apply the Functional Dependency, Decomposition and Normalization.	
CO 5	Illustrate the Database Recovery and Database Security.	

K1: Remember; K2: Understand; K3: Apply; K4: Analyze

Unit - I	**Database Concepts**

Introduction to Database Systems : Introduction - Basic Concepts and Definitions - Data Dictionary - Database - Database System - Data Administrator (DA) - Database Administrator (DBA) - File-oriented System versus Database System - Historical Perspective of Database Systems - Database Language - Transaction Management - **Database System Architecture:** Schemas, sub-schemas, and Instances - Three-level ANSI-SPARC Database Architecture - Data Independence - Mappings - Structure, Components, and Functions of DBMS - Data Models - Types of Database Systems.

Unit - II	**Relational Model**

The Relational Algebra and Calculus: Introduction - Historical Perspective of Relational Model - Structure of Relational Database - Relational Algebra - Relational Calculus -

QUESTION PAPER PATTERN

Time: 3 hours	Max. Marks: 50
SECTION-A (10 X 1 = 10 Marks) Answer ALL questions Choose the correct answer Two questions from each unit	**SECTION-B (5 X 3 = 15 Marks)** Answer ALL questions Either or type Two questions from each unit	**SECTION-C (5 X 5 = 25 Marks)** Answer ALL questions Either or type Two questions from each unit

Mapping of COs with POs and PSOs:

PO/PSO CO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	L	L	M	S	S	S	M	M	S
CO2	S	L	L	L	L	M	S	S	M	S	M	S
CO3	S	L	L	L	L	M	M	S	S	M	M	S
CO4	S	L	L	L	L	M	M	S	M	M	M	S
CO5	S	L	L	L	L	M	M	S	M	M	M	S

S-Strong, M-Medium, L-Low

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Relational Query Languages: Introduction - Codd's Rules - Structured Query Language (SQL) - Embedded Structured Query Language (SQL).

Unit - III	Entity- Relationship Model

Entity-Relationship (ER) Model: Introduction - Basic E-R Concepts - Conversion of E-R Model into Relations - Problems with E-R Models - E-R Diagram Symbols - **Enhanced Entity - Relationship (EER) Model:** Introduction - Subclasses, Subclass Entity Types and Super-classes - Specialisation and Generalisation - Categorisation.

Unit - IV	Functional Dependency and Normalization

Functional Dependency and Decomposition: Functional Dependency - Decomposition - **Normalization:** Introduction - Normalization - Normal Forms - Boyce-Codd Normal Forms (BCNF) - Multi-valued Dependencies and Fourth Normal Forms (4NF) - Join Dependencies and Fifth Normal Forms (5NF).

Unit - V	Transaction and Security Management

Transaction Processing and Concurrency Control: Introduction - Transaction Concepts - Concurrency Control - **Database Recovery System:** Introduction - Database Recovery Concepts - Types of Database Failures - Types of Database Recovery - Recovery Techniques - **Database Security:** Introduction - Goals of Database Security - Discretionary Access Control - Mandatory Access Control.

Skill Development Activities

1.	Prepare Relational Database Schema for Hospital Management Database.
2.	Create employee database and process the database using all possible SQL commands.
3.	Draw E-R diagram for Banking Organization Database.
4.	Describe and illustrate the process of normalization for the Student Management System.
5.	Draw state transition diagram for Online Food Ordering System.

TEXT BOOK

1. Shio Kumar Singh, Database Systems Concepts, Designs and Application, Second Edition, Pearson, First Impression, 2011.

REFERENCE BOOKS

1. Abraham Silberschatz, Henry F.Korth, Sudarshan, Database System Concepts, 5th Edition, McGraw-Hill International Edition, 2006.

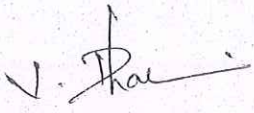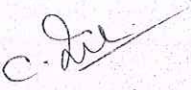| 2.	C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education, New Delhi, 2008.

WEB RESOURCES

1.	https://www.tutorialspoint.com/dbms/index.htm
2.	http://www.nptelvideos.in/2012/11/database-management-system.html

Course Designed By	Verified By	Approved By HOD
V. Dha~	C. Lil	S. M. Arang
(Ms. V.Dharani)	(Ms. C.Indrani)	(Mr. S.Muruganantham)

QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	5 x 3 = 15 Marks	5 x 5 = 25 Marks
Answer ALL questions	Answer ALL questions	Answer ALL questions
Choose the correct answer	Either or type	Either or type
Two questions from each unit	Two questions from each unit	Two questions from each unit

Mapping of COs with POs and PSOs

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	S	S	M	M	S	M	S	S	M	S	M
CO 2	S	M	M	M	M	M	M	S	S	M	M	S
CO 3	S	M	M	M	M	M	M	S	S	M	M	S
CO 4	S	M	M	M	M	M	M	S	S	M	M	S
CO 5	S	M	M	M	M	M	S	S	M	M	S

S-Strong, M-Medium, L-Low

Sem	Course Code	Core Practical 2: Database Management Systems Lab	Total Marks: 100	Hours Per Week	Credits
II	21UAMCP203		CIA: 50	ESE: 50	3	3

Course Objectives:

1. To enable the students to implement the basic concepts involved in designing and building a database management systems.
2. To enable the students to study the various DDL and DML commands.
3. To gain employability opportunities to build database systems and demonstrate their competence.

Course Outcomes (CO) : On completion of the course, students should be able to

CO 1	Construct a table and apply common SQL statement using DML to perform different operations.	
CO 2	Apply common SQL statements including DDL and aggregate functions to perform different operations.	K1 - K4
CO 3	Implement the concept of String functions, Date functions and Cursors.	
CO 4	Demonstrate the knowledge of Triggers and DCL statements.	
CO 5	Develop the concept of PL/SQL Procedure, Functions and Exception.	

K1: Remember; K2: Understand; K3: Apply; K4: Analyze
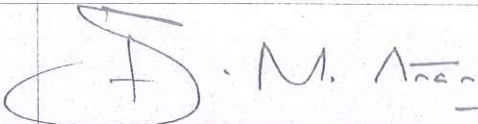
Programs

1. Design a database for an enterprise and perform insertion, deletion, altering, updating and viewing records based on conditions.

2. Create a Student Information table and use various data manipulation language commands.

3. Create an inventory table and use various data definition language commands.

4. Create queries using aggregate functions.

5. Create queries using conversion functions, string functions and date functions.

6. Develop a program using CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

7. Create a database trigger.

8. Create a payroll table and use ROLLBACK, COMMIT, SAVEPOINT, GRANT and REVOKE commands.

9. Create a PL/SQL procedure and functions.

10. Create a PL/SQL block to handle the exception.

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Course Designed By	Verified By	Approved By HOD
(Ms. V.Dharani)	(Ms. C.Indrani)	(Mr. S. Muruganantham)

Mapping of COs with POs and PSOs

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	S	S	M	M	M	M	S	S	M	S	M
CO 2	S	S	S	M	M	M	M	S	S	M	M	S
CO 3	S	S	S	M	M	M	M	S	S	M	M	S
CO 4	S	S	S	S	S	S	S	S	S	M	M	S
CO 5	S	S	S	S	S	S	S	S	S	S	M	S

S-Strong, M-Medium, L-Low

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Semester	Course code	ALLIED PAPER: II	Total Marks:100		Hours Per Week	Credits
		DISCRETE MATHEMATICS			5	4
II	21UAMAT204		CIA : 50	ESE :50		

Course Objectives:

1. To enable the students to understand the concepts of Discrete Structures.
2. To teach about the concept of relations and functions.
3. To impart the knowledge of lattices and Boolean algebra.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Know about Connectives & Well-formed Formulas.	K1-K4
CO 2	Attain knowledge about Normal Forms and Predicate Calculus.	K1-K4
CO 3	Solve the real time problems on Relations.	K1-K4
CO 4	Acquire knowledge on Functions and Grammars.	K1-K4
CO 5	Compare the characteristics of Lattices and discuss about Boolean algebra .	K1-K4

K1: Recall; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create.

Unit –I :	Connectives

Negation - Conjunction - Disjunction - Statement Formulas and Truth Tables - Conditional and Bi conditional - Well-formed Formulas–Tautologies - Equivalence of formulas– Duality law– Tautological implications.

Chapter 1 : Sections 1.2.1-1.2.4, 1.2.6-1.2.11 Page no : 7-14,18-35

Unit – II :	Connectives and Predicate Calculus

Normal Forms: Disjunctive Normal Form – Conjunctive Normal Form – Principle Disjunctive Normal Form – Principle Conjunctive Normal Form.

Predicate Calculus: Predicates - The Statement Function, Variables and Quantifiers - Predicate Formulas- Free and Bound Variables. Theory of Inference for the Predicate Calculus.

Chapter 1 : Sections 1.3.1-1.3.4, 1.5.1-1.5.4, 1.6.4 Page no : 50-58,80-87,96-99

Unit – III :	Set Theory

Relations and Ordering: Relations–Properties of Binary Relations in a Set–Relations Matrix and Graph of a Relation–Equivalence Relations–Composition of Binary Relations – Partial Ordering – Partially Ordered Set: Representation and Associated Terminology.

Chapter 2 : Sections 2.3.1-2.3.3, 2.3.5, 2.3.7-2.3.9 Page no : 148-162,164-166,176-192

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Unit – IV :	Set Theory and Algebraic Structures

Functions: Definition and Introduction–Composition of functions–Inverse functions.

Grammar and Languages: Discussion of Grammars - Formal Definition of a Language.

Chapter 2 : Sections 2.4.1-2.4.3   Page no : 192-205

Chapter 3 : Sections 3.3.1-3.3.2   Page no   : 294-304

Unit – V :	Lattices and Boolean Algebra

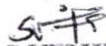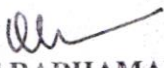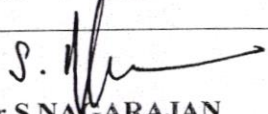Lattices: Introduction-Lattices as Partially Ordered Sets-Definition and Examples – Some Properties of Lattices – Some Special Lattices.

Boolean Algebra: Definition and Examples–Boolean Functions-Boolean functions and Free Boolean Algebra- Values of Boolean expressions and Boolean functions.

Chapter 4 : Sections 4.1.1,4.1.2, 4.1.5, 4.2.1, 4.3.1,4.3.2   Page no : 378-385,392-401,406-418

Skill Development Activities

1. List out and explain the real life applications of Discrete Mathematics.

2. Explain briefly about the use of Mathematical connectives in real life.

3. List out and explain the applications of Discrete Mathematics in the field of Computer Science.

TEXT BOOK

1	J. P Tremblay and R Manohar, "Discrete Mathematical Structures with Applications to Computer Science", 31st Reprint, Mc Graw Hill International, 2008.

REFERENCE BOOKS

1	J.K.Sharma, "Discrete Mathematics", Second Edition, Macmillan India Ltd, 2005.
2	K. Balakrishnan, "Introductory Discrete Mathematics", Dover Publications Incs, October 2010.

WEB RESOURCES

1	http://www.math.wise.edu>free221
2	www.ma.huji.ac.il>iWeb>Teaching_files

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Course Designed By	Verified By	Approved By HOD
Ms.S.VIDHYA	Ms.C.RADHAMANI	Dr.S.NAGARAJAN

QUESTION PAPER PATTERN

Time: 3 hours	Max. Marks: 50

SECTION-A (10 X 1 = 10 Marks)	SECTION-B (5 X 3 = 15 Marks)	SECTION-C (5 X 5 = 25 Marks)
Answer ALL questions	Answer ALL questions	Answer ALL questions
Choose the correct answer	Either or type	Either or type
Two questions from each unit	Two questions from each unit	Two questions from each unit

Mapping of COs with POs and PSOs:

PO/PSO CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	M	L	L	L	S	S	S	M	S	S
CO2	S	M	M	L	L	L	S	S	S	S	S	S
CO3	S	M	M	L	L	L	S	S	S	M	S	S
CO4	S	M	M	L	L	L	S	S	S	M	S	S
CO5	S	M	M	L	L	L	S	S	S	M	S	S

S-Strong, M-Medium, L-Low

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Sem	Course Code	Core 5: Database Systems	Total Marks : 100		Hours Per Week	Credits
III	17UAMCT301		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to have a strong foundation of database concepts and develop the skills for the design and implementation of a database application.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of database systems and their architectures.

CO2 Illustrate the concept of relational algebra, calculus and relational query language.

CO3 Summarize the concepts of Entity Relationship Model and Enhanced Entity Relationship Model.

CO4 Apply the Functional Dependency, Decomposition and Normalization.

CO5 Describe the Database Recovery and Database Security.

UNIT - I

Introduction to Database Systems: Introduction - Basic Concepts and Definitions - Data Dictionary - Database - Database System - Data Administrator (DA) - Database Administrator (DBA) - File-oriented System versus Database System - Historical Perspective of Database Systems - Database Language - Transaction Management - **Database System Architecture:** Schemas, sub-schemas, and Instances - Three-level ANSI-SPARC Database Architecture - Data Independence - Mappings - Structure, Components, and Functions of DBMS - Data Models - Types of Database Systems.

UNIT - II

The Relational Algebra and Calculus: Introduction - Historical Perspective of Relational Model - Structure of Relational Database - Relational Algebra - Relational Calculus - **Relational Query Languages:** Introduction - Codd's Rules - Structured Query Language (SQL) - Embedded Structured Query Language (SQL).

UNIT - III

Entity-Relationship (ER) Model: Introduction - Basic E-R Concepts - Conversion of E-R Model into Relations - Problems with E-R Models - E-R Diagram - Symbols -

Enhanced Entity - Relationship (EER) Model: Introduction - Subclasses, Subclass Entity Types and Super-classes - Specialisation and Generalisation - Categorisation.

UNIT - IV

Functional Dependency and Decomposition: Functional Dependency - Decomposition - **Normalization:** Introduction - Normalization - Normal Forms - Boyce-Codd Normal Forms (BCNF) - Multi-valued Dependencies and Fourth Normal Forms (4NF) - Join Dependencies and Fifth Normal Forms (5NF).

UNIT - V

Transaction Processing and Concurrency Control: Introduction - Transaction Concepts - Concurrency Control - **Database Recovery System:** Introduction - Database Recovery Concepts - Types of Database Failures - Types of Database Recovery - Recovery Techniques - **Database Security:** Introduction - Goals of Database Security - Discretionary Access Control - Mandatory Access Control.

TEXTBOOK:

Shio Kumar Singh, Database Systems Concepts, Designs and Application, Second Edition, Pearson, First Impression, 2011.

BOOKS FOR REFERENCE:

1. Abraham Silberschatz, Henry F.Korth, Sudarshan, Database System Concepts, 5th Edition, McGraw-Hill International Edition, 2006.

2. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education, New Delhi, 2008.

3. Rajesh Narang, Database Management Systems, 2nd Edition, Eastern Economy Edition, 2011.

4. Ramakrishnan, Gehrke, Database Management Systems, 3rd Edition, McGraw-Hill, 2003.

5. Alexis leon, Mathews leon, Essentials of Database Management Systems, Vijay Nicole Imprints Private Limited, 2006.

QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	5 x 7 = 35 Marks	3 x 10 = 30 Marks
(Multiple choice, Four options)	(Either or choice)	(Answer any three questions)
Two questions from each unit	Two questions from each unit	One question from each unit

Sem	Course Code	Core 6: Java Programming	Total Marks : 100		Hours Per Week	Credits
III	17UAMCT302		CIA : 25	ESE: 75	6	4

OBJECTIVE:

  To enable the students to learn about JAVA features, Packages, AWT and JDBC concepts.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Identify the basic concepts of java including class and flow control statements.

CO2 Apply the principles of inheritance, interface, polymorphism, exception handling and threads.

CO3 Demonstrate the concepts of packages and I/O operations.

CO4 Describe the concepts of applets and exception handling mechanisms.

CO5 Develop an application using AWT and JDBC.

UNIT - I

Introduction: Evolution of Java - Features of Java - Java Environment - Exploring Data Types - Variables - Literals - Type Casting and Conversion - Constants and Separators - Working with Operators - Arrays - **Class:** Working with Classes - Identifying variable Scope - Working with Constructors - **Flow Control Statements:** Implementing the Conditional Statements - Implementing the Iteration Statements - Implementing the Jump Statements.

UNIT - II

Inheritance, Interface and Polymorphism: Working with Inheritance - Working with Abstract Class - Working with Interfaces in Java - Working with Polymorphism - **Exception Handling:** Handling Exception in Java - **Threads:** Defining Threads - Instantiating a Thread - Starting Threads - Starting and Running Multiple Threads - Thread States - Implementing Thread Synchronization mechanism - Implementing Thread Interaction.

UNIT - III

Package: The Built-in Packages - The User-defined Packages - **Handling I/O Operations:** Exploring the java.io Package - Working with Streams - Writing Console Output - Reading and Writing files - **java.lang Package:** Describing Wrapper Classes in Java -
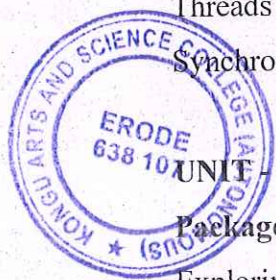
Working with Strings in java - **java.util Package:** Describing Vectors in Java - Working with the Enumeration and Iterator Interfaces - Describing the Collection Framework.

UNIT - IV

Applets: Overview of Applets - Creating Applets - Working with the Graphic Class - Working with the Color class - Working with the Font class - **Event Handling:** Overview of Events - Listeners of Events - Exploring the Methods of Event Listeners - Using Adapter class.

UNIT - V

AWT: Working with java.awt Package - Creating a Desktop Application using AWT - **Swing:** Creating a Desktop Application using Swing - Implementing the Layout Manager - **JDBC:** Introduction to JDBC - Exploring JDBC Drivers - Creating a simple JDBC Application.

TEXTBOOK:

Black Book, Java 6 and J2EE 1.5(Java EE5), Dreamtech Press, Reprint 2011.
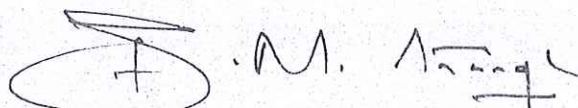
BOOKS FOR REFERENCE:

1. Patrick Naughton and Herbert Schildt, JAVA2 - The Complete Reference, Seventh Edition, Tata McGraw-Hill Publishing Company, New Delhi, 2006.

2. Deitel H.M and Deitel P.J, JAVA - How to Program, Sixth Edition, Pearson Prentice Hall, New Delhi, 2005.

3. E.Balagurusamy, Working with JAVA a Primer, Fourth Edition, Tata McGraw-Hill Publishing Company, 2010.

4. Cay S.Horstmann Gary Cornell, Core JAVA Volume 1 - Fundamentals, 8th Edition, Pearson Education, 2011.

5. C.Xavier, Programming with JAVA2, Scitech Publications (INDIA) Pvt. Ltd., Reprint 2003.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Head of the Department,
Department of Computer Technology
and Information Technology,
Kongu Arts and Science College (Autonomous)

Sem	Course Code	Core Lab 3: Java Programming Lab	Total Marks: 100		Hours Per Week	Credits
III	17UAMCP303		CIA: 40	ESE: 60	6	4

OBJECTIVE:

To enable the students to understand the knowledge of object oriented paradigm in the Java programming language.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Apply java concepts includes class, method and constructor.

CO2 Design the concept of inheritance and exception handling.

CO3 Implement the usage of package and file handling operations.

CO4 Implement the methods of creating applets and mouse events.

CO5 Develop an application using swing and JDBC.

1. Write a Java program to demonstrate the use of class and methods.

2. Write a Java program to demonstrate the constructor.

3. Write a Java program to implement inheritance.

4. Write a Java program to create an exception and throw the exception.

5. Write a Java program to implement the usage of package.

6. Write a Java program for handling file operations.

7. Write a Java program to create an applets.

8. Write a Java program for handling mouse events.

9. Write a Java program to demonstrate the use of swing for front end development.

10. Write a Java program to develop an application with JDBC.

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Head of the Department,
Department of Computer Technology
and Information Technology,
Kongu Arts and Science College (Autonomous)
Erode - 638 107,

Sem	Course Code	Allied 3: Microprocessor and ALP	Total Marks: 100		Hours Per Week	Credits
III	17UAMAT304		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to understand the basics of 8085 microprocessor based systems and assembly language programming.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of microcomputer systems.

CO2 Describe the 8085 microprocessor architecture and memory interfacing.

CO3 Make use of the instruction set of 8085 microprocessor and develop assembly codes to solve problems.

CO4 Illustrate the use of Counters and Time Delays and Stack and Subroutine.

CO5 Implement the 8085 interrupts and interface the microprocessors with 8259A and DMA.

UNIT - I

Microcomputer Systems: Microprocessor Architecture and Its Operations - Microprocessor Initiated Operations and 8085 Bus Organization - Internal Data Operations and the 8085 Registers - Peripheral Initiated Operations - Memory Classification.

UNIT - II

8085 Microprocessor Architecture and Memory Interfacing: The 8085 Microprocessor - Microprocessor Communications and Bus Timings - Demultiplexing the Bus - Generating Control Signals - 8085 MPU and Its Architecture - Memory Interfacing: Memory Structure and Its Requirements - Basic Concepts in Memory Interfacing - Address Decoding - Address Decoding and Memory Addresses.

UNIT - III

Introduction to 8085 Instructions: Data Transfer (Copy) Operations - Arithmetic Operations - Logic Operations - Branch Operations - **Programming Techniques:** Looping, Counting, and Indexing - Additional Data Transfer and 16 bit Arithmetic Instructions - Arithmetic Operations Related to Memory - Logic Operations: Rotate and Compare - **Assembly Language Programs:** Addition of Two 8 Bit Numbers - Block Transfer of Data Bytes - To Sort an Array of Data in Ascending Order.
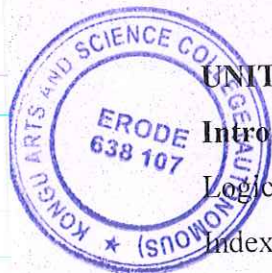
UNIT - IV

Counters and Time Delays: Time Delay Using One Register - Time Delay Using a Register Pair - Time Delay Using a Loop within a Loop Technique - Counter Design with Time Delay - Hexadecimal Counter - **Stack and Subroutines:** Stack - Subroutine - Restart, Conditional Call, and Return Instructions - Advanced Subroutine Concepts.

UNIT - V

Interrupts: The 8085 Interrupt - 8085 Vectored Interrupts: TRAP, RST 7.5, RST 6.5, and RST 5.5 - I/O Concepts and Processes: Programmable Interrupt Controller (8259A) - Direct Memory Access (DMA).

TEXTBOOK:

Ramesh S. Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, 5th Edition, Penram International Publishing (India) Private Limited, 2011.

BOOKS FOR REFERENCE:

1. Douglas V.Hall, Microprocessors and Interfacing: Programming and Hardware, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, 1999.

2. Aditya P.Mathur, Introduction to Microprocessors, 3rd Edition, Tata McGraw-Hill Publishing Company Limited, 1995.

3. A.Ray, K.M. Bhurchandi, Advanced Microprocessors and Peripherals:Architecture, Programming and Interfacing, 3rd Edition, Tata McGraw-Hill Publishing Company Limited, 1995.

4. Badari Ram, Fundamentals of Microprocessor and Microcomputers, 5th Edition, Dhanpal Rai Publications, 2003.

5. Soumitra Kumar Mandal, Microprocessors and Microcontrollers Architecture, Programming and Interfacing using 8085, 8086 and 8051, 1st Edition, Tata McGraw-Hill Publishing Company Limited, 2011.

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QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	5 x 7 = 35 Marks	3 x 10 = 30 Marks
(Multiple choice, Four options) Two questions from each unit	(Either or choice) Two questions from each unit	(Answer any three questions) One question from each unit

Sem	Course Code	Skill Based Course 1 (Lab): Database Systems Lab	Total Marks: 75		Hours Per Week	Credits
III	17UAMSP305		CIA: 30	ESE: 45	4	3

OBJECTIVE:

To enable the students to implement the basic concepts involved in designing and building a database management system.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Create a table and apply common SQL statement using DML to perform different operations.

CO2 Apply common SQL statements including DDL and aggregate functions to perform different operations.

CO3 Implement the concept of String functions, Date functions and Cursors.

CO4 Demonstrate the knowledge of Triggers and DCL statements.

CO5 Develop the concept of PL/SQL Procedure, Functions and Exception.

1. Design a database for an enterprise and perform insertion, deletion, altering, updating and viewing records based on conditions.

2. Create a Student Information table and use various data manipulation language commands.

3. Create an inventory table and use various data definition language commands.

4. Create queries using aggregate functions.

5. Create queries using conversion functions, string functions and date functions.

6. Develop a program using CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

7. Create a database trigger.

8. Create a payroll table and use ROLLBACK, COMMIT, SAVEPOINT, GRANT and REVOKE commands.

9. Create a PL/SQL procedure and functions.

10. Create a PL/SQL block to handle the exception.

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2. Alexis Leon, Mathews Leon, Fundamentals of Information Technology, First Edition, Vikas Publishing House Private Limited, 1999.

3. Alexis Leon, Mathews Leon, Introduction to Information Systems, First Edition, Vijay Nicole Imprints Private Limited, 2004.

4. Pradeep Mathur, Information Technology, First Edition, Saurabh Publishing House, 2010.

5. V. Rajaraman, Fundamentals of Computers, Sixth Edition, Prentice Hall of India Private Limited, 2014.

QUESTION PAPER PATTERN
SECTION - A
5 x 15 = 75 Marks (Either or choice) Two questions from each unit

@ Offered to other department students.

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Sem.	Course Code	Non major Elective - I Fundamentals of Accounting	Total Marks: 75	Hours Per Week	Credits
III	17UAGNT307		ESE: 75	2	2

Objective:

On successful completion of this course, the students will understand the basic concepts of Accountancy and how to use its techniques to solve the modern business problems.

Course outcomes:

On Completion of this course student will be able to

CO1 Understand the basic concepts and golden rules of accounting.

CO2 Develop the ability to use a basic accounting system.

CO3 Acquire Knowledge about the subsidiary books.

CO4 Understand the preparation of financial statements

CO5 Acquire knowledge in Bank reconciliation statement.

UNIT-I

Fundamentals of book keeping – Accounting concepts and conventions –Rules for accounting equation.

UNIT-II

Journal – Ledger – Distinguish between Journal and Ledger.

UNIT-III

Subsidiary books – Benefits – Basic documents of Subsidiary books. Cash book – Single column cash book – Double column cash book – Triple column cash book.

UNIT –IV

Final Accounts- Trading account – Items appearing on the debit and credit side of Trading Account - Profit and Loss account - Items appearing on the debit and credit side of Profit and Loss account - Balance sheet of a sole trader without adjustments – Classification of Assets and Liabilities.

UNIT-V

Bank reconciliation statement –Difference between cash book and pass book.

Note: Distribution of Marks: Theory - 60% and Problems- 40%

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Text book:

T.S. Reddy & A.Murthy, Financial Accounting, 8th Edition, Margham publication, 2012.

Books for Reference:

1.   V.K.Goyal & Ruchi Goyal, Financial Accounting,4TH Edition, PHI Publisher,2012.

2.   S.P.Jain &K.L.Narang, Advance Accounting, Kalayani publisher,2012.

3.   S.N.Maheswari & S.K. Maheswari, Financial Accounting, 5th edition, vikas

     publishers,2014.

QUESTION PAPER PATTERN

SECTION - A
5 x 15 = 75 Marks
Five Questions (Either or choice)
Two questions from each unit

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638 107

Sem	Course Code	Core 7: Operating Systems	Total Marks : 100		Hours Per Week	Credits
IV	17UAMCT401		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the structures and functions of the operating systems.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of the basic functionality of operating systems.
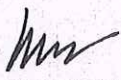
CO2 Identify the concepts of processes and threads.

CO3 Apply the deadlock and processor scheduling.

CO4 Describe the memory management and virtual memory.

CO5 Illustrate the concepts of I/O management and disk scheduling.

UNIT - I

Operating System Overview: Operating System Objectives and Functions - The Evolution of Operating Systems - **Process Description and Control:** Process - Process States - Process Description - Process Control.

UNIT - II

Threads, SMP, and Microkernels: Processes and Threads - Symmetric Multiprocessing (SMP) - **Concurrency: Mutual Exclusion and Synchronization:** Principles of Concurrency - Mutual Exclusion: Hardware Support - Semaphores.

UNIT - III

Concurrency: Deadlock and Starvation: Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - **Uniprocessor Scheduling:** Types of Scheduling - Scheduling Algorithms.

UNIT - IV

Memory Management: Memory Management Requirements - Memory Partitioning - Paging - Segmentation - **Virtual Memory:** Hardware and Control Structures - Operating System Software: Fetch Policy - Placement Policy - Replacement Policy - Frame Locking - Basic Algorithms - Page Buffering - Replacement Policy and Cache Size.

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UNIT - V

I/O Management and Disk Scheduling: I/O Devices - Organization of the I/O Function - Operating System Design Issues - I/O Buffering - Disk Scheduling - Disk Cache - **File Management:** File Organization and Access - File Directories - File Sharing - Record Blocking - Secondary Storage Management.

TEXTBOOK:
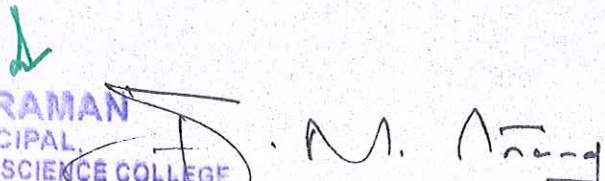
William Stallings, Operating Systems - Internals and Design Principles, Sixth Edition, Prentice Hall, 2009.

BOOKS FOR REFERENCE:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles, Seventh Edition , John Wiley & Sons, Reprint, 2007.

2. Deitel H. M., P.J. Deitel, D.R. Choffnes, Operating Systems, Third Edition, Pearson Education, First Impression, 2007.

3. Andrew S. Tanenbaum, Albert S.WoodHull, Operating Systems - Design and Implementation, Second Edition, Prentice Hall of India, Eleventh Indian Reprint, 1999.

4. Achyut S. Godbole, Operating Systems, Second Edition, Tata McGraw Hill, New Delhi, Fourth Reprint, 2008.

5. Harsh Marwah, Operating System, ANMOL publications Pvt. Ltd., 2011.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core 8: Web Technology	Total Marks: 100		Hours Per Week	Credits
IV	17UAMCT402		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn about web programming and internet to acquire advanced web page designing techniques for professional applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of web programming and Internet.

CO2 Create web pages using XHTML and Cascading Style Sheet.

CO3 Build the dynamic web pages using JavaScript.

CO4 Implement the advanced concepts such as Servlets and JSP to create dynamic web pages.

CO5 Illustrate XML documents, schemas and build interactive web applications using AJAX.

UNIT - I

Web Essentials: The Internet - Basic Internet Protocols - The World Wide Web - HTTP Request Message - HTTP Response Message - Web Clients - Web Servers.

UNIT - II

XHTML and CSS: An Introduction to HTML - HTML's History and Versions - Basic XHTML Syntax and Semantics - Fundamental HTML Elements - Relative URL's - Lists - Tables - Frames - Forms - Defining XHTML Abstract Syntax: XML - Creating HTML Documents - **Cascading Style Sheet:** Introduction - Features - Syntax - Style Sheets and HTML - Style Rule Cascading and Inheritance - Text Properties - Box Models - Normal Flow Box Layout.

UNIT - III

JavaScript: History and Versions - Introduction - JavaScript in Perspective - Basic Syntax - Variables and Data Types - Statements - Operators - Literals - Functions - Object - Arrays - Built-in Objects - JavaScript Debuggers.

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UNIT - IV

Servlets and JSP: Servlet Architecture Overview - Servlet Generating Dynamic Content - Life Cycle - Parameter Data - Sessions - Cookies - **JSP:** Introduction - JSP and Servlets - Running JSP Applications - Basic JSP - JavaBeans Classes and JSP - Tag Libraries and Files.

UNIT - V

XML: XML Documents and Vocabularies - Versions and Declarations - Namespaces - JavaScript and XML: Ajax - DOM based XML Processing - Event Oriented Parsing - XML Documents - Selecting XML Data: Xpath - Template-based Transformation: XSLT - Displaying XML Documents in Browsers.

TEXTBOOK:

Jeffrey C. Jackson, Web Technologies - A Computer Science Perspective, Pearson Education, 2007.

BOOKS FOR REFERENCE:

1. Deitel P.J and Deitel H.M, Internet and World Wide Web How to program, 4th Edition PHI, 2008.

2. Thomas A. Powell, Web Design: The Complete Reference, 2nd Edition, Tata MCGraw-Hill, 2007.

3. Powers Shelley, Dynamic Web Publishing, 2nd Edition Techmedia, New Delhi, 2004.

4. Michael Morrison, HTML and XML for beginners, PHI, New Delhi, 2001.

5. NIIT, HTML and XML: An Introduction, Prentice Hall of India, New Delhi, 2003.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core Lab 4: Web Technology Lab	Total Marks: 100		Hours Per Week	Credits
IV	17UAMCP403		CIA: 40	ESE: 60	6	4

OBJECTIVE:

To enable the students to learn about web programming and ability to design and implement static and dynamic websites.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Identify the basic HTML elements and their attributes.

CO2 Build a static website and add dynamic functionality to it by using JavaScript.

CO3 Develop online applications using Servlets and JSP.

CO4 Implement XML documents and schemas.

CO5 Design and launch web services.

HTML

1. Write HTML code to create a webpage that contains an image at its left hand side of the page when user clicks on the image it should open another webpage that displays the details of the image using HREF tag attributes.

2. Create a Web page that will have the following:

    a) Frames

    b) Unordered Lists

    c) Nested and ordered Lists

3. Create a Web page Layout with Tables and all its attributes.

4. Write HTML code to develop a web page for giving details of your name, age, address. It contains the different background and foreground color, with different attributes of font tags like bold, italic, underline etc. and gives suitable heading style.

CSS

5. To create an HTML file by applying the different styles using inline, external & internal style sheets.

JAVASCRIPT

6. Write a javascript program to define a user defined function for sorting the values in an array.

7. Write a javascript code to display the calendar by getting the year from the user.
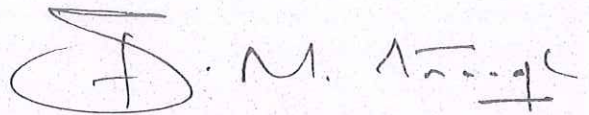
SERVLET AND JSP

8. To create a servlet program to retrieve the values entered in the html file.

9. Develop online applications using java server pages.

XML

10. Create XML file using XSL style sheet.

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Sem	Course Code	Allied 4: Embedded Systems	Total Marks: 100		Hours Per Week	Credits
IV	17UAMAT404		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To provide a clear understanding on architecture, programming tools, hardware platforms and concepts of Real-Time Operating Systems.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate an understanding of concepts and architecture of embedded systems.

CO2 Develop a program for embedded systems using C, C++ and Java.

CO3 Identify the hardware platforms and communication interface required for developing embedded systems.

CO4 Implement the concepts of real-time operating systems.

CO5 Illustrate the process of creating a target image and development of navigation system.

UNIT - I

Introduction to Embedded Systems: What is an Embedded System? - Application Areas - Categories of Embedded Systems - Overview of Embedded System Architecture - Specialties of Embedded Systems - Recent Trends in Embedded Systems - **Architecture of Embedded Systems:** Hardware Architecture - Software Architecture - Application Software - Communication Software - Process of Generating Executable Image - Development/Testing Tools.

UNIT - II

Programming for Embedded Systems: Overview of ANSI C - GNU Development Tools - Bit Manipulation using C - Memory Management - Timing of Programs - Device Drivers - Productivity Tools - Code Optimization - C Coding Guidelines - Java 2 Micro Edition (J2ME) - Server-Side Programming - Java Development Tools.

UNIT - III

Hardware Platforms: Types of Hardware Platforms - 89C51 Micro-controller Development Board - AVR Micro-controller Development Board - **Communication Interfaces:** Need for Communication Interfaces - RS232/UART - RS422/RS485 - US - Infrared - IEEE 1394 Fireware - Ethernet - IEEE 802.11 - Bluetooth.

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UNIT - IV

Real-Time Operating System Concepts: Architecture of the Kernel - Tasks and Task Scheduler - Interrupt Service Routines - Semaphores - Mutex - Mailboxes - Message Queues - Event Registers - Pipes - Signals - Timers - Memory Management - Priority Inversion Problem - **Overview of Real-Time Operating Systems:** Off-the-shelf Operating Systems - Embedded Operating Systems - Real-Time Operating Systems - Handheld Operating Systems.

UNIT - V

Target Image Correction - Operating System Software - Target Image Creation for Windows XP Embedded - Porting RTOS on a Micro-controller Development Board - **Representative Embedded Systems:** Digital Thermometer - Handheld Computer - Navigation System - IP Phone - Software-defined Radio - Smart Cards - RF Tags - **Development of Navigation System:** Project Overview - Development Environment - GPS Receiver Packet Format - Implementation - Executing the Program.

TEXTBOOK:

Dr. K.V.K.K. Prasad, Real-Time Systems: Concepts, Design & Programming Black Book, Dreamtech Press, India, Reprint Edition 2011.

BOOKS FOR REFERENCE:

1. Steve Heath, Embedded Systems Design, 2nd Edition, Elsevier, 2005.

2. David E. Simon, An Embedded Software Primer, 2nd Edition, Pearson Education, 2008.

3. Raj Kamal, Embedded Systems: Architecture, Programming and Design, 2nd Edition, Tata McGraw-Hill publishing company Limited, 2008.

4. Wayne Wolf, Computers As Components: Principles of Embedded Computer System Design, Elsevier, 2006.

5. James K. Peckol, Embedded Systems: A Contemporary Design Tool, 1st Edition, Wiley India Pvt. Limited, 2009.
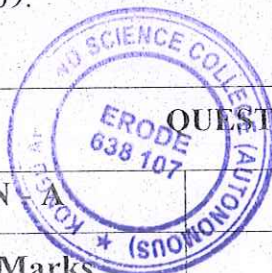
Head of the Department

QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	5 x 7 = 35 Marks	3 x 10 = 30 Marks
(Multiple choice, Four options)	(Either or choice)	(Answer any three questions)
Two questions from each unit	Two questions from each unit	One question from each unit

Sem	Course Code	Skill Based Course 2 (Lab): Multimedia Lab	Total Marks: 75		Hours Per Week	Credits
IV	17UAMSP405		CIA: 30	ESE: 45	4	3

OBJECTIVE:

To enable the students to learn about multimedia programming and ability to use photoshop.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Design simple logos and banners using photoshop.

CO2 Create plastic surgery and text animation using photoshop.

CO3 Design visiting cards and realistic structures in photoshop.

CO4 Create cover pages for books and brochure about any function or event using photoshop.

CO5 Create color photo from black and white photo and design web pages using photoshop.

1. Create a simple logo using Photoshop.

2. Create an own interactive banner using Photoshop.

3. Create a see through text using Photoshop.

4. Create a plastic surgery for the nose using Photoshop.

5. Create a realistic stone structure using Photoshop.

6. Create a visiting card using Photoshop.

7. Create a cover page for any text book using Photoshop.

8. Create brochure for college using Photoshop.

9. Convert a black and white photo into color photo using Photoshop.

10. Create a web page using Photoshop.

D. M. Arul

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Sem	Course Code	Advanced Learners Course 1 - A: Linux Programming	Total Marks: 100		Hours Per Week	Credits
IV	17UAMAL407		CIA: -	ESE: 100	-	2

OBJECTIVE:

To enable the students to learn about Linux Operating System Files, Directories, vi Editor and Shell Scripts.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Describe the Linux Operating System.

CO2 Demonstrate the understanding of the files and directories.

CO3 Utilize the vi Editor to create files.

CO4 Identify the securing files in Linux and automate tasks using shell scripts.

CO5 Demonstrate the conditional execution in shell scripts and manage repetitive tasks using shell scripts.

UNIT - I

Introduction to LINUX Operating System: Introduction: Operating Systems - Functions of an Operating System - Types of Systems - The Linux Operating System: The History of Linux - Linux Architecture - Linux Compared to UNIX - Features and Utilities in Linux - Shells Available in Linux - Beginning a Linux Session: Logging On - Security for Users: Passwords - Referring to the Linux Help Manual - Editing a Linux Session: Logging Off.

UNIT - II

Merging Files and Directories: Introduction: The Linux File System - File-Naming Conventions - Relative Path Names - Types of Files in Linux - Types of Users in Linux - Directory Commands in Linux: Identifying the Current Directory Path - Changing the Current Directory - Creating a Directory - Removing a Directory - Listing the Contents of a Directory - File Commands in Linux: Displaying the Content of Files - The head and tail commands - Copying Files - Removing Files - Moving and Renaming Files - Displaying the Contents Pagewise.

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UNIT - III

Creating Files Using the vi Editor: Text Editors: Functions of a Text Editor - Editors Available with Linux - The vi Editor: Getting Started with the vi Editor - Commands Used in the vi Editor - **Managing Documents:** Locating Files in Linux - Standard Files - Redirection - Filters - Pipes.

UNIT - IV

Securing Files in Linux: File Access Permissions - Viewing File Access Permissions - Changing File Access Permissions - **Automating Tasks Using Shell Scripts:** Introduction - Variables - Local and Global Shell Variables - Command Substitution.

UNIT - V

Using Conditional Execution in Shell Scripts: Condition Execution - The case...ecase Construt - **Managing Repetitive Tasks Using Shell Scripts:** Using Iteration in Shell Scripts - The While construct - The until construct - The for construct - The break and continue Commands.

TEXT BOOK:

NIIT, Operating System Linux , Prentice Hall of India Private Limited, 2003.

BOOKS FOR REFERENCE:

1. John Goerzen, Linux Programming Bible,WILEY - dreamtech India(P) Ltd, Reprint 2003.
2. Neil Matthew,Richard Stones, Beginning Linux Programming, 4th Edition, Wiley India Pvt.Ltd, Reprint2008.
3. Richard L.Petersen, Object The Complete Reference Linux , Fifth Edition, Tata McGraw-Hill Publishing Company Limited,2003.
4. Grant Taylor, Linux Complete, First Indian Edition, PBP Publications, 2000.
5. Danial P.Bovet and Marco Cesati, Understanding the Linux Kernel, 2ndEdition, SDP O' REILLY Publications, Third Indian Reprint 2004.

QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 2 = 20 Marks 10 questions out of 12	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3 x 15 = 45 Marks (Answer any three questions) One question from each unit

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Sem	Course Code	Advanced Learners Course 1 - B: PC Hardware	Total Marks: 100		Hours Per Week	Credits
IV	17UAMAL408		CIA: -	ESE: 100	-	2

OBJECTIVE:

To enable the students to learn the basics of computer hardware components.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of the fundamentals of PC technology and microprocessor.

CO2 Identify the components of motherboard.

CO3 Classify the types of memory, magnetic storage devices and optical storage devices.

CO4 Describe keyboards, pointing devices, video subsystems and printers.

CO5 Apply the trouble shooting tools and techniques, basic data recovery and disaster recovery.

UNIT - I

Fundamentals of PC Technology: Fundamental Building Blocks of the PC - Principles of CPU Operation: Basic PC Signaling Principles - Buses - **The Microprocessor:** CPU Operation - Troubleshooting the CPU.

UNIT - II

Motherboards: Motherboard Controllers and System Resources - The I/O System Bus - Onboard I/O Devices - Chipsets - ROM BIOS - ROM POST - CMOS Setup - Motherboard Physical Form Factors.

UNIT - III

Memory: How Memory Works - Memory Chips and Modules - Module Sizes and Banks of Memory - Parity Checking and ECC - DRAM Timing and Memory Types - Troubleshooting Memory - Advanced Memory Technologies - **Magnetic Storage Devices:** Magnetic Storage - Hard Disk Drives - Floppy Disk Drives - Cartridge Drives - **Optical Storage Devices:** Optical Storage Media - CD-ROM Drives - DVD-ROM Drives - Recordable Drives.

UNIT - IV

Keyboards and Pointing Devices: Keyboards - Pointing Devices - **The Video Subsystem:** Monitors - **Printers:** Printer Types: Laser Printer - Dot Matrix Printer - **Printer Maintenance:** Laser Printer Maintenance - Dot Matrix Printer Maintenance.

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UNIT - V

Trouble Shooting Tools and Techniques: Tools of the Trade - Basic PC Handling Techniques - **Basic Data Recovery and Disaster Recovery:** Disk Structure and Data Recovery - Disaster Recovery.

TEXTBOOK:

Craig Zacker, John Rourke, PC Hardware: The Complete Reference, Tata McGraw-Hill, 24th Reprint, 2013.
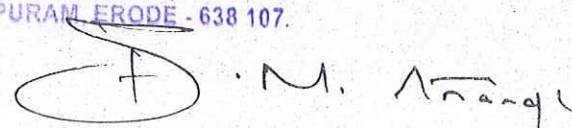
BOOKS FOR REFERENCE:

1. Scott Muller, Upgrading and Repairing PCs, 13th Edition, Pearson Education, 2007.
2. K.L. James, Computer Hardware Installation, Interfacing, Troubleshooting and Maintenance, PHI Learning Private Limited, Delhi, 2013.
3. B.Govindarajulu, IBM PC and Clones Hardware, Troubleshooting and Maintenance, Second Edition, Tata McGraw-Hill, 2002.
4. Hans Peter Messemer, The Indispensible PC Hardware Book, 4th Edition, Addison - Wesley, 2001.
5. N.Mathivanan, Microprocessors, PC Hardware and Interfacing, Prentice-Hall of India, Fourth Reprint, 2006.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 2 = 20 Marks 10 questions out of 12	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 15 = 45 Marks** (Answer any three questions) One question from each unit

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Sem.	Course Code	Non major Elective - II Practical Auditing	Total Marks: 75	Hours Per Week	Credits
IV	17UAGNT407		ESE:75	2	2

Objective:

On successful completion of this course, the students will become well versed in the fundamental concepts of auditing.

Course Outcome:

On Completion of this course student will be able to

CO1 Learn the role of auditing in business.

CO2 Understanding the steps involved in the audit of accounts and

practical implementation of auditing in business world.

CO3 Possess knowledge on verification and valuation of various assets and liabilities.

CO4 Familiarise with provisions of the companies act relating to the

appointment, conduct and liabilities of an auditor .

CO5 Understanding the fundamental audit concepts in Specialised Audit

Unit I

Auditing – Meaning – Objectives – Classification of Audit

Unit II

Internal Control – Internal check – Internal audit – Audit note book –Audit working paper – Audit programme

Unit III

Vouching – Verification and Valuation of Assets and Liabilities

Unit IV

Specialised Audits – Educational institutions, Hospitals, Hotels, Banking and Insurance companies.

Unit V

Company Auditor – Appointment – Qualification – Disqualification – Removal of Auditor – Audit Report – Duties, Powers and Liabilities of Auditors

Text Book:

B.N.Tandon, Practical Auditing, S.Chand Publishers, New Delhi, 2005

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Books for References:

1. Spicer & Pegler, Auditing, Mc Millan Publication, New Delhi, 2000.

2. Dinakar Pagare, Principles & Practice of Auditing, Sultan Chand & Sons, New Delhi, 2004.

QUESTION PAPER PATTERN
SECTION – A 5 x 15 = 75 Marks Five questions (either or choice) Two questions from each unit

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Sem	Course Code	Core 9 : Data Communications and Networks	Total Marks : 100		Hours Per Week	Credits
V	17UAMCT501		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the various components in a data communication system, network protocols, architecture and applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of the basic terminology and concepts of the OSI and the Internet model.

CO2 Explain the transmission media, multiplexing and telephone network.

CO3 Illustrate the concepts of data link layer, data link control protocols and multiple access.

CO4 Illustrate the concepts of network layer protocols and routing protocols.

CO5 Demonstrate the detailed understanding of various protocols of the transport layer and applications of DNS and electronic mail.

UNIT - I

Introduction: Data Communications - Networks - The Internet - Protocols and Standards - **Network Models:** Layered Tasks - Internet Model - OSI Model.

UNIT - II

Physical Layer: Signals: Analog and Digital - Analog Signals - Digital Signals - **Digital Transmission:** Line Coding - Block Coding - Sampling - Transmission Mode - **Analog Transmission:** Modulation of Digital Data - Modulation of Analog Signals - **Multiplexing:** FDM - WDM - TDM - **Transmission Media:** Guided Media - Unguided Media: Wireless - **Circuit Switching and Telephone Network:** Circuit Switching - Telephone Network.

UNIT - III

Data Link Layer: Error Detection and Correction: Types of Errors - Detection - Error Correction - **Data Link Control and Protocols:** Flow and Error Control - Stop-and-Wait ARQ - Go-Back-N ARQ - Selective Repeat ARQ - **Multiple Access:** Random Access - Controlled Access - Channelization - **Local Area Networks: Ethernet:** Traditional Ethernet - Fast Ethernet - Gigabit Ethernet - **Wireless LANs:** IEEE 802.11.

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UNIT - IV

Network Layer: Internetworks - Addressing - Routing - Network Layer Protocols: ARP, IPv4, ICMP, IPv6 and ICMPv6: ARP - IP - ICMP - IPv6 - Unicast and Multicast Routing: Routing Protocols: Unicast Routing - Unicast Routing Protocols - Multicast Routing - Multicast Routing Protocols.

UNIT - V

Transport Layer: Process-to-Process Delivery - User Datagram Protocol (UDP) - Transmission Control Protocol (TCP) - **Congestion Control and Quality of Service:** Congestion - Congestion Control - Quality of Service - Techniques to Improve QOS - **Application Layer: Domain Name System (DNS):** Name Space - Domain Name Space - Distribution of Name Space - DNS in the Internet - Resolution - DNS Messages - **Electronic Mail (SMTP) and File Transfer (FTP):** Electronic Mail - File Transfer.

TEXTBOOK:

Behrouz A. Forouzan, Data Communications and Networking, Third Edition, Tata McGraw-Hill. Second Reprint, 2004.

BOOKS FOR REFERENCE:

1. Andrew S. Tanenbaum, David J.Wetherall, Computer Networks, Fifth Edition, Pearson, Second Impression, 2013.

2. Achyut S. Godbole, Data Communications and Networks, Tata McGraw-Hill, Twelfth Reprint, 2008.

3. Andrew S. Tanenbaum, Computer Networks, Fourth Edition, Pearson, Eighth Impression, 2011.

4. Larry L. Peterson, Bruce S. Davie, Computer Networks - a systems approach, Fifth Edition, Elsevier, First Indian Reprint, 2011.

5. Schaum's Outlines, Computer Networking, Tata McGraw-Hill Edition, Second Reprint, 2011.

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QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	5 x 7 = 35 Marks	3 x 10 = 30 Marks
(Multiple choice, Four options)	(Either or choice)	(Answer any three questions)
Two questions from each unit	Two questions from each unit	One question from each unit

Sem	Course Code	Core 10: Software Engineering	Total Marks: 100		Hours Per Week	Credits
V	17UAMCT502		CIA: 25	ESE: 75	5	4

OBJECTIVE:

To enable the students to learn the software engineering principles.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Define the key aspects in the software engineering and process models.

CO2 Apply the software requirement engineering tasks in the project.

CO3 Develop the different systematic design models for the project.

CO4 Apply the various testing procedures in the project.

CO5 Use the various software quality standards in the project.

UNIT - I

Introduction to Software Engineering: The Evolving Role of Software - Software - Software Myths - **A Generic View of Process:** Software Engineering - A Layered Technology - A Process Framework - The Capability Maturity Model Integration (CMMI) - **Process Models:** Prescriptive Models - The Waterfall Model - Incremental Process Models - Evolutionary Process Models.

UNIT - II

Requirements Engineering: Requirements Engineering Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Developing Use-Cases - Building the Analysis Model - Negotiating Requirements - Validating Requirements.

UNIT - III

Building the Analysis Model: Data Modeling Concepts - Scenario-Based Modeling - Flow Oriented Modeling - Class-Based Modeling - Creating a Behavioral Model - **Design Engineering:** Design Concepts - The Design Model.

UNIT - IV

Testing Strategies: A Strategic Approach to Software Testing - Test Strategies for Conventional Software - Validation Testing - System Testing - **Testing Tactics:** Software Testing

Fundamentals - White-Box Testing - Basis Path Testing - Control Structure Testing - Black-Box Testing.

UNIT - V

Quality Management: Quality Concepts - Software Quality Assurance - Software Reviews - Formal Technical Reviews - Formal Approaches to SQA - Statistical Software Quality Assurance - Software Reliability - The ISO 9000 Quality Standards - The SQA Plan.

TEXTBOOK:

Roger S.Pressman, Software Engineering - A Practitioner's Approach, Sixth Edition McGraw - Hill International Edition, 2005.

BOOKS FOR REFERENCE:

1. Sommerville, Software Engineering, Eighth Edition, Pearson Education Limited, 2007.

2. Ali Behforooz and Frederick J.Hudson, Software Engineering Fundamentals, Indian Edition, Oxford University Press, Fifth Impression 2008.

3. James F.Peters, Witold Pedrycz, Software Engineering - An Engineering Approach, Wiley India Edition, John Wiley & Sons Inc., Reprint 2007.

4. Pankaj Jalote, An Integrated Approach Software to Engineering, Third Edition, Narosa Publishing House, New Delhi, Tenth Reprint 2008.

5. Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill Edition, 35th Reprint 2011.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core 11: Visual Basic .NET Programming	Total Marks: 100		Hours Per Week	Credits
V	17UAMCT503		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the .NET Technology.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of the .NET environment features and the .NET applications.

CO2 Design the forms and reports using the VB.NET features.

CO3 Construct the programs using the database concepts.

CO4 Design the web forms and websites using the ASP .NET features.

CO5 Apply the control features in the web forms.

UNIT - I

Visual Studio .NET: Key Components of the .NET Framework - Application Execution in the .NET Framework - Exploring Visual Studio .NET: Visual Basic .NET Advantages - Applications Commonly Developed in Visual Studio .NET - Visual Studio .NET IDE: Visual Studio Interface - Customizing Development Environment.

UNIT - II

Windows Forms: Introduction to Visual Basic .NET - Creating Windows Forms - Working with Controls - Windows Forms - Variables - Controlling Program Flow - Procedures in Visual Basic .NET.

UNIT - III

Implementing VB .NET Classes - Handling Errors in Visual Basic .NET - Accessing a Database.

UNIT - IV

Web Forms: Introducing ASP .NET - ASP .NET Applications - ASP .NET Web Forms Server Controls - Working with Validation Controls - Developing ASP .NET Server Controls.

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UNIT - V

Rich Web Controls - Data Binding with Server Controls - Working with Web Server Control Templates - ADO .NET with ASP .NET.

TEXTBOOK:

Mridula Parihar, Yesh Singhal, Nitin Pandey, Visual Studio .NET Programming, Wiley dreamtech india Pvt. Ltd, First Edition, 2002, Reprint 2007.

BOOKS FOR REFERENCE:

1. Jeffrey R.Shapiro, Visual Basic .NET: The Complete Reference, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002, Eleventh Reprint 2007.

2. Steven Holzner, Visual Basic .NET Programming, Black Book, Dreamtech Press, Reprint Edition 2008.

3. Deitel & Deitel, Nieto, Visual Basic .NET How to Program,Pearson Education, Second Edition, Second Indian Reprint 2005.

4. Bill Evjen, Jason Beres, et al., Visual Basic .NET Programming Bible, Wiley India(P) Ltd, New Delhi, 2006.

5. C.Muthu, Visual Basic .NET, Tata McGraw Hill, Vijay Nicole Imprints Private Limited, First Reprint 2008.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core Lab 5: VB .NET Programming Lab	Total Marks: 100		Hours Per Week	Credits
V	17UAMCP504		CIA: 40	ESE: 60	5	4

OBJECTIVE:

To enable the students to do the programs in the .NET platform using visual basic programming.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Design the forms by using the property features in the visual basic .NET environment.

CO2 Design and develop the forms, menus, tool bars and status bars in the visual basic .NET environment.

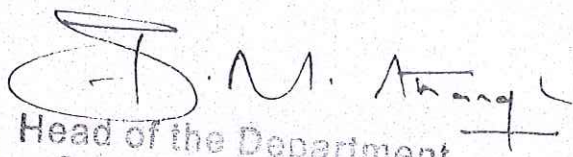CO3 Develop the software applications by connecting the databases.

CO4 Design the web forms by using the ASP .NET controls.

CO5 Design and develop websites.

1. Write a program to design an Arithmetic Calculator using Buttons and Textbox.

2. Write a program to create Digital Clock using Label and Timer.

3. Write a program to create Menus, Status Bars and Tool Bars.

4. Write a program for Keyboard and Mouse events.

5. Write a program to select image from list box and display it in the picture box.

6. Write a program to perform the following basic data manipulations using ADO .NET.

     (i) Insertion (ii) Updation (iii) Deletion

7. Write a program to create E-Mail registration form using Web Controls and Validation Controls.

8. Develop a web application to retrieve data from the web form and display it in the Client browser in table format.

9. Write a program to create an application for Personal Website.

10. Write a program to create an application for College portal.

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Sem	Course Code	Elective - I - A: Programming in PHP	Total Marks : 100		Hours Per Week	Credits
V	17UAMET505		CIA : 25	ESE: 75	5	4

OBJECTIVE:

To enable the students to learn the practices of programming in PHP and MYSQL.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the usage of variables and operators in PHP script.

CO2 Illustrate the program flow control and arrays.

CO3 Summarize the concepts of functions, classes, files and directories.

CO4 Describe the database and structured query language extension.

CO5 Apply the concepts of cookies, sessions and securing PHP.

UNIT - I

Introduction: Basic Development Concepts - Creating PHP Script - **Variables and Operators:** Storing Data in Variables - Understanding PHP's Data Types - Setting and Checking Variable Data Types - Using Constants - Manipulating Variables with Operators - Handling Form Input.
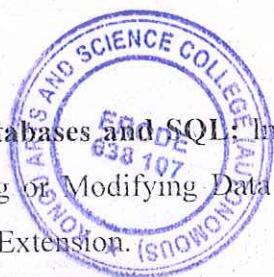
UNIT - II

Controlling Program Flow: Writing Simple Conditional Statements - Writing Complex Conditional Statements - Repeating Actions with Loops - Working with String and Numeric Functions - **Working with Arrays:** Storing Data in Arrays - Processing Arrays with Loops and Iterators - Using Arrays with Forms - Working with Array Functions - Working with Dates and Times.

UNIT - III

Functions and Classes: Creating User Defined Functions - Creating Classes - Using Advanced OOP Concepts - **Working with Files and Directories:** Reading Files - Writing Files - Processing Directories.

UNIT - IV

Working with Databases and SQL: Introducing Databases and SQL - Using PHP's MySQLi Extension - Adding or Modifying Data - Handling Errors - Using PHP's SQLite Extension - Using PHP's PDO Extension.

UNIT - V

Cookies and Sessions: Working with Cookies - Working with Sessions - Securing PHP: Sanitizing Input and Output - Securing Data - Securing Configuration Files - Securing Database Access - Securing Sessions - Validating User Input - Working with Required Fields - Working with Numbers - Working with Strings - Working with Dates - Configuring PHP Security.

TEXTBOOK:

Vikram Vaswani, PHP A Beginners's Guide, McGraw Hill Education (India) Edition, 2009.

BOOKS FOR REFERENCE:

1. Steven Holzner, The PHP Complete Reference, Tata McGraw-Hill Education (India) Private Limited, 2008.

2. Matt Doyle, Beginning PHP 5.3, Wiley India Private Limited, 2010, Reprint 2012.

3. Mcgrath Mike, PHP programming in Easy Steps, Dream Tech Publication, First Edition 2002.

4. Lerdorf Rasmus, Tatroe Kevin, Macintyre Peter, Programming PHP, Shroff Publishers & Distributors Private Limited, Second Edition, 2006.

5. Josh Lockhart, Modern PHP New Features and Good Practices, O Rielly, 2015.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Skill Based Course 3 (Lab): PHP Programming Lab	Total Marks: 75		Hours Per Week	Credits
V	17UAMSP508		CIA: 30	ESE: 45	3	3

OBJECTIVE:

To enable the students to learn PHP and MYSQL in creating web application.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Implement the methods of HTML and message passing mechanism between forms.

CO2 Develop the program using control structures and date and time functions.

CO3 Implement the usage of file handling operations, string and arrays.

CO4 Develop an application using the concepts of MYSQL.

CO5 Install an application using cookie, session and form validation.

1. Develop a PHP program to display HTML content.

2. Develop a PHP program and check message passing mechanism between pages.

3. Develop a PHP program using control structures.

4. Develop a PHP program using Date and Time functions.

5. Develop a PHP program to read a file, reverse its contents and write the result back into a new file.

6. Develop a PHP program using String function and Arrays.

7. Develop a PHP program to display student information using MYSQL table.

8. Develop a PHP program to design a college application form using MYSQL table.

9. Develop a PHP program using cookie and session.

10. Develop a PHP program for form validation.

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Sem	Course Code	Advanced Learners Course 2 - A: J2EE	Total Marks: 100		Hours Per Week	Credits
V	17UAMAL509		CIA: -	ESE: 100	-	2

OBJECTIVE:

To enable the students to learn about developing J2EE applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Describe the enterprise applications, building blocks and architecture.

CO2 Create dynamic java pages with servlets and JSP.

CO3 Demonstrate JDBC with SQL Databases and JNDI.

CO4 Implement the RMI mechanism and EJB techniques.

CO5 Illustrate the development of JMS and transactions with JTA/JTS.

UNIT - I

Defining the Enterprise: The architecture of an enterprise application - The building blocks of an enterprise application - Introducing J2EE - Downloading and installing J2EE - **Enterprise Applications:** Business-to-Consumer Applications - Business-to-Business Applications - Back-End Applications.

UNIT - II

Creating Dynamic Content with Servlets: Creating a Basic HttpServlet - The Servlet APIs - Saving and Sharing information - Adding Functionality with filter(), forward() and include() - **JavaServer Pages:** Creating a Basic JSP Page - Putting the "J" in JSP - Adding Java Beans - Custom Tags - Bringing JSPs and Servlets Together.

UNIT - III

JDBC to Interact with SQL Databases: Java Abstractions of a Database - Connecting to a Database - Database Data Structures - Interacting with the Database - Enterprise Features - **Accessing Directory Services with JNDI:** Java Abstraction of Directory Services - Connecting to a Service - Interacting with Databases.

UNIT - IV

Exploring the RMI mechanism: The Components of a Basic RMI Application - Running a distributed version - Non-Remote Objects - Activating Services -
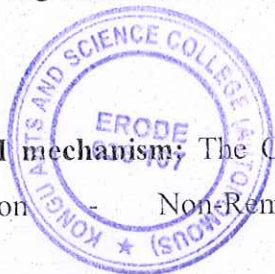
Enterprise JavaBeans: Introducing a new level of abstraction - Exploring the components of an EJB service - Enterprise Beans on the server side - Enterprise Beans on the Client Side - Advanced EJB Techniques: Extending Enterprise Beans - Message-Driven Beans - Understanding Container-Managed Persistence - Managing Bean-Security Issues.

UNIT - V

JMS: Types of Messaging Systems - JMS Overview - JMS System Setup - Administered Objects - Sending and Receiving Messages - Application Development with JMS - JMS and J2EE - **Managing Transactions with JTA/JTS:** Java Transaction Service - Java Transaction API - How Do I Use JTA/JTS - ACME Widgets Inc.-A Shopping Cart Demo.

TEXTBOOK:

Justin Couch and Daniel H. Steinberg, J2EE Bible, WILEY dreamtech India Pvt. Ltd., First Edition 2002.

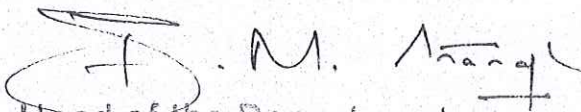## BOOKS FOR REFERENCE:

1. Pallavi Jain and Shadab Siddiqui with NIIT, J2EE Professional Projects, Prentice Hall of India Private Limited, 2002.

2. Java 6 and J2EE1.5 Black Book, Kognet Learning Solutions, Reprint 2011.

3. B V Kumar, S Sangeetha, S V Subrahmanya, J2EE Architecture, Tata McGraw- Hill Edition, The McGraw-Hill Companies, 2007.

4. Pankaj Kumar, J2EE Security for Servlets, EJBs and Web Services, Prentice Hall Professional, 2004

5. Bond Martin Law Debbie Longshaw Andy & Et Al, Teach Yourself J2EE in 21 Days, Pearson Education India, 2007

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 2 = 20 Marks 10 questions out of 12	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 15 = 45 Marks** (Answer any three questions) One question from each unit

Sem	Course Code	Advanced Learners Course 2 - B: Middleware Technology	Total Marks: 100		Hours Per Week	Credits
V	17UAMAL510		CIA: -	ESE: 100	-	2

OBJECTIVE:

To enable the students to learn the overview of Client/Server concepts, various Middleware Technologies and their roles.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Describe the concepts of client server computing.

CO2 Demonstrate the understanding of the Java Bean component model with EJB.

CO3 Apply the client server applications using heterogeneous programming languages with EJB.

CO4 Describe the object oriented middleware basics through the CORBA.

CO5 Illustrate the development of distributed object fundamentals.

UNIT - I

Client/Server Computing: What is Client/Server? - File Servers - Database Servers - Transaction Servers - Groupware Server - Object Servers - Web Servers - Middleware - General Middleware - Service specific middleware - Client/Server Building Blocks - RPC - Messaging - Peer to Peer.

UNIT - II

EJB's Architecture: Logical Architecture - Overview of EJB's Software Architecture - A High Level View of EJB Conversation - Building and Deploying EJBs - Roles in EJB.

UNIT - III

EJB Applications: Writing EJB Session Beans - Writing EJB Entity Beans - EJB Clients - EJB Deployment.

UNIT - IV

CORBA: An Introduction to CORBA: CORBA Overview - CORBA Concepts - CORBA's Growth - CORBA Interface Definition Language - The CORBA 2 Standard.

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UNIT - V

Distributed Object Fundamentals: Selecting Data Types - Defining the Interfaces - Proxies. Stubs and Skeletons - Implementing the Servers - Implementing the Clients - Creating Objects - Invoking Object Methods - Destroying Objects.

TEXTBOOK:

1. Robert Orfali, Dan Harkey and Jeri Edwards, The Essential Client/Server Survival Guide, Second Edition, Galgotia Publications, 2002 (UNIT I).

2. Tom Valesky, Enterprise Java Beans, Second Edition, Pearson Education, 2002 (UNIT II & III).

3. Thomas J.Mowbray, Willam A.Ruth, Inside CORBA, Addison Wesley, Third Printing February, 1998 (UNIT IV).

4. Jason Pritchard, COM and CORBA Side by Side, Second Edition, Addison Wesley, 2000 (UNIT V).

BOOKS FOR REFERENCE:

1. Mowbray, Inside CORBA, First Edition, Pearson Education, 2002.

2. Judith M. Myerson, The Complete Book of Middleware, Second Edition, Auerbach Publications, 2002.

3. Arno Puder, Kay Romer, Frank Pilhofer, Distributed System Architecture - A Middleware Approach, First Edition, Elsevier, 2005.

4. G. Sudha Sadasivam, Component Based Technology, Second Edition, Wiley India, 2008.

5. Edward Yourdon, Paul Allen, Stuart Frost, Component-Based Development for Enterprise Systems, First Edition, Cambridge University Press, 1998.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 2 = 20 Marks 10 questions out of 12	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 15 = 45 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core 12 : Information Security	Total Marks : 100		Hours Per Week	Credits
VI	17UAMCT601		CIA : 25	ESE: 75	6	5

OBJECTIVE:

To enable the students to learn the basics of information security including attacks and controls.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of computer security and encryption techniques.

CO2 Explain the concepts of program security and protection in general purpose operating systems.

CO3 Illustrate the concepts of security in database.

CO4 Illustrate the concepts of security in network, symmetric encryptions and public key encryption systems.

CO5 Demonstrate the detailed understanding of legal and ethical issues in computer security.

UNIT - I

Introduction: Security Attacks - Computer Criminals - Methods of defense - **Elementary Cryptography**: Terminology and Background - Substitution Ciphers: The Caesar Cipher - One-time pads - Transpositions.

UNIT - II

Program Security: Secure Programs - Nonmalicious Program Errors - Targeted Malicious Code - **Protection in General-Purpose Operating Systems:** Memory and Address Protection - File Protection Mechanisms - User Authentication: Password as Authenticators - Attacks on Passwords - Biometrics: Authentication Not Using Passwords.

UNIT - III

Database Security: Security Requirements - Reliability and Integrity - Sensitive Data - Inference - Multilevel Databases - Proposals for Multilevel Security.

UNIT - IV

Security in Networks: Threats in Networks - Network Security Controls - Firewalls - Secure E-mail - **Cryptography:** Symmetric Encryptions - Public Key Encryption Systems.

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UNIT- V

Administering Security: Security Planning - Risk Analysis - Legal and Ethical Issues in Computer Security: Protecting Programs and Data - Information and the Law- Redress for Software Failures - Computer Crime.

TEXTBOOK:

Charles P.Pfleeger, Shari Lawrence Pfleeger, Security in Computing, Fourth Edition, Prentice-Hall of India Private Limited, 2008.

BOOKS FOR REFERENCE:

1. Stalling, Cryptography and Network Security: Principles and Practice, Fourth Edition, Prentice Hall, 2006.

2. Kanfman, Perlman, Speciner, Network Security, Second Edition, Prentice Hall, 2003.

3. Eric Maiwald, Network Security: A Beginner's Guide, Third Edition, Tata McGraw-Hill Publishing Company Limited, 1999.

4. Macro Pistoia, Java Network Security, Second Edition, Pearson Education , 1999.

5. Whitman, Mattord, Principles of Information Security, Second Edition, Thomson Publications, 2005.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core Lab 6: Information Security Lab	Total Marks: 100		Hours Per Week	Credits
VI	17UAMCP602		CIA: 40	ESE: 60	5	4

OBJECTIVE:

To enable the students to implement the encryption, decryption and cryptography using various algorithms.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Develop an algorithm to encrypt data using Caesar and Vernam Cipher.

CO2 Develop an algorithm to encrypt data using code-book cipher and transposition cipher.

CO3 Implement DES and AES.

CO4 Develop an algorithm to check authentication and verify password strength.

CO5 Implement Diffie-Hellman and RSA.

1. Write a program to encrypt data using Caesar cipher method.

2. Write a program to encrypt data using Vernam cipher method.

3. Write a program to encrypt and decrypt data using code-book cipher method.

4. Write a program to encrypt data using transposition cipher method.

5. Write a program to implement DES algorithm.

6. Write a program to implement AES algorithm.

7. Write a program to secure the Database using User Authentication security.

8. Write a program to check whether a password is strong or weak.

9. Write a program to implement the Public Key Cryptography using Diffie-Hellman algorithm.

10. Write a program to implement the Public Key Cryptography using RSA algorithm.

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Sem	Course Code	Elective - II - B: Data Mining	Total Marks: 100		Hours Per Week	Credits
VI	17UAMET604		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the techniques of mining the databases.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Illustrate the basic data mining concepts and their importance in business intelligent applications.

CO2 Identify and understand the fundamental technologies used in data mining techniques.

CO3 Demonstrate the understanding of the classification algorithms in the real world data sets.

CO4 Demonstrate the understanding of the clustering algorithms in the real world data sets.

CO5 Construct the association rules from the data sets.

UNIT - I

Introduction: Basic Data Mining Tasks - Data Mining Versus Knowledge Discovery in Databases - Data Mining Issues - Data Mining Metrics - Social Implications of Data Mining - Data Mining from a Database Perspective.

UNIT - II

Data Mining Techniques: Introduction - A Statistical Perspective on Data Mining - Similarity Measures - Decision Trees - Neural Networks - Genetic Algorithms.

UNIT - III

Classification: Introduction - Statistical-Based Algorithms - Distance-Based Algorithms - Decision-Tree-Based Algorithms - Neural Network-Based Algorithms - Rule-Based Algorithms - Combining Techniques.

UNIT - IV

Clustering: Introduction - Similarity and Distance Measures - Outliers - Hierarchical Algorithms - **Partitional Algorithms:** Minimum Spanning Tree - Squared Error Clustering Algorithm - K-means Clustering - Nearest Neighbor Algorithm - Clustering with Genetic Algorithm - Clustering with Neural Networks - **Clustering Large Databases:** BIRCH - DBSCAN - Clustering with Categorical Attributes.

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UNIT - V

Association Rules: Introduction - Large Itemsets - Basic Algorithms - Comparing Approaches - Advanced Association Rule Techniques - Measuring the Quality of Rules.

TEXTBOOK:

Margaret H.Dunham. Data Mining Introductory and Advanced Topics, Pearson Publications. Seventeenth Impression 2013.

BOOKS FOR REFERENCE:

1. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Second Edition, Elsevier Reprinted 2010.

2. David Hand, Heikki Mannila, Padhraic Smyth, Principles of Data Mining, PHI Learning, New Delhi, 2006.

3. S.Sumathi, S.N.Sivanandam, Introduction to Data Mining and its Applications. Springer International Edition, First Indian Reprint 2009.

4. Alex Berson, Stephen J Smith, Data Warehousing, Data Mining, & OLAP, Tata McGraw-Hill Publishing Company Limited, Eighth Reprint 2006.

5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education, Second Impression 2008.

QUESTION PAPER PATTERN		
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Sem	Course Code	Elective - III - C: Internet of Things	Total Marks: 100		Hours Per Week	Credits
VI	17UAMET608		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the building blocks of Internet of Things and understand the application area of Internet of Things.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Illustrate the Internet of Things enabling technologies and IOT levels.

CO2 Demonstrate the understanding of the basic domain specific IOTs.

CO3 Describe the various applications of IOT.

CO4 Apply the IOT design methodology using Python.

CO5 Illustrate the concepts of IOT Physical Devices.

UNIT - I

Introduction & Concepts: Introduction to Internet of Things - Physical Design of IOT - Logical Design of IOT - IOT Enabling Technologies - IOT Levels.

UNIT - II

Domain Specific IOTs: Home Automation - Cities - Environment - Energy - Retail - Logistics - Agriculture - Industry - Health & Life Style.

UNIT - III

M2M & System Management with NETCONF-YANG: M2M - Difference between IOT and M2M - SDN and NFV for IOT - Software defined Networking - Network Function Virtualization - Need for IOT Systems Management - Simple Network Management Protocol - Limitations of SNMP - Network Operator Requirements - NETCONF - YANG - IOT Systems management with NETCONF-YANG.

UNIT - IV

Developing Internet of Things & Logical Design using Python: Introduction - IOT Design Methodology - Installing Python - Python Data Types & Data Structures - Control Flow Functions - Modules - Packages - File Handling - Date/Time Operations - Classes - Python - Packages.

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UNIT - V

IOT Physical Devices & Endpoints: What is an IOT Device? - Exemplary Device: Raspberry Pi - Board - Linux on Raspberry Pi - Raspberry Pi Interfaces - Programming Raspberry Pi with Python - other IoT things.

TEXTBOOK:

Arshdeep Bahga, Vijay Madisetti, Internet of Things - A hands-on approach, Universities Press, 2014.

BOOKS FOR REFERENCE:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017

2. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things - Key applications and protocols, Wiley, 2012

3. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand, David Boyle, From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence, Elsevier, 2014.

4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), Architecting the Internet of Things, Springer, 2011.

5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011.

QUESTION PAPER PATTERN		
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Sem	Course Code	Project Work	Total Marks : 100		Hours Per Week	Credits
VI	17UAMCV609		CIA : 20	ESE: 80	4	4

GUIDELINES FOR PROJECT WORK

GENERAL

- Student has to take up the project work for a period of six months.

- The project may be developed using the software package that they have learned from the courses studied or implementation of any innovative idea.

- Guide will be allocated to each student and the project title should be approved by the guide.

- The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

- Students should communicate with their guides regularly about the progress of the project.

- Review Presentation is to be given only on the approval of the guide.

- Rough Draft report should be submitted to their guides after 10 days from Second Review.

- Students should submit one copy of the fair draft report in the form of hard binding during the End Semester Examination after they are duly signed by the concerned guides and the Head of the Department.

- No Students will be permitted to appear for viva voce without the project report.

- The impressions on the typed copies should be black in colour. The font and size should be: **'TimesNewRoman - 12 point'.**

- One and a half spacing should be used for typing the general text and all paragraphs should be justified. The margins should be: Left - 1.25'', Right - 1'', Top and Bottom - 0.75''. The format for typing Chapter headings, Division headings and Sub-division headings are explained by the following illustrative
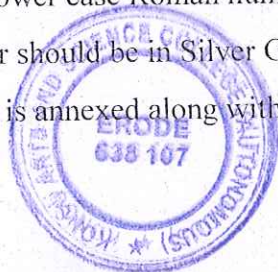
  Chapter Heading : CHAPTER 1

  INTRODUCTION

  Division Heading : 1.1 SYSTEM SPECIFICATION

  1.1.1 HARDWARE CONFIGURATION

- All page numbers should be typed in Arabic numbers and the preliminary pages should be numbered in lower case Roman numerals.

- Cover wrapper should be in Silver Grey colour.

- The specimen is annexed along with the Project guidelines.

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DISTRIBUTION OF INTERNAL MARKS

S.No.	Parameters	Maximum Marks
1.	First Review	5
2.	Second Review	5
3.	Final Review	5
4.	Attendance	5
	Total	**20**

DISTRIBUTION OF EXTERNAL MARKS

S.No.	Parameters	Maximum Marks
1.	Project Work	60
2.	Viva voce	20
	Total	**80***

* Jointly evaluated by Internal and External Examiners.

A candidate who secures not less than 40% in the end semester examination (external) and 40% marks in the external examination and continuous internal assessment put together shall be declared to have passed the examination in the course.

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PROJECT WORK
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TITLE OF THE PROJECT WORK
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Bonafide Work Done by
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STUDENT NAME
REG. NO. :
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fulfilment of the requirements for the award of
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BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
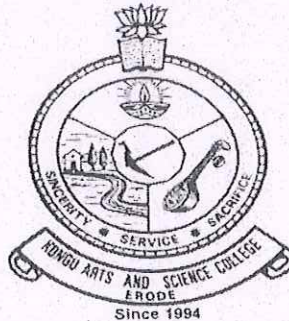< Font Size - 14 Bold >

Under the guidance of
< Font Size - 14>

NAME OF THE GUIDE
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[Designation]
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Since 1994

Department of Computer Technology and Information Technology
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KONGU ARTS AND SCIENCE COLLEGE
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(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
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ERODE - 638 107
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PROJECT WORK
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REG. NO. :
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A project report submitted in partial
fulfilment of the requirements for the award of
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Bachelor of Science in Information Technology
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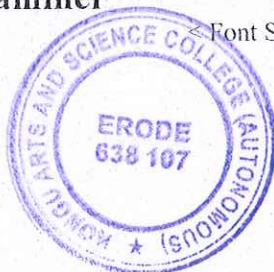**Guide**   **Head of the Department**

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_____

Submitted for the Viva-Voce Examination held on _____
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Internal Examiner   **External Examiner**

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(A typical Specimen of Contents Page)

CONTENTS

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Sem	Course Code	Skill Based Course 4 (Lab): Software Engineering and CASE Tools Lab	Total Marks: 75		Hours Per Week	Credits
VI	17UAMSP610		CIA: 30	ESE: 45	3	3

OBJECTIVE:

To enable the students to develop the phases of software engineering.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Develop the project planning phase for the software application.

CO2 Develop the software requirement analysis document for the software application.

CO3 Develop the design models for the software application.

CO4 Develop the source code for the software project.

CO5 Construct the test cases for the software project.

Perform the software engineering activity mentioned below for the Student Mark Analysis system and Payroll Processing system.

1. **Problem Analysis and Project Planning:**

    Study the problem and prepare the project scope, objective and Gantt chart.

2. **Requirement Analysis:**

    Identify the phases and individual modules of the project and prepare the software requirement specification.

3. **Design:**

    i. Draw the following UML diagrams:

    - Use-case diagram

    - Activity diagram

    - Class diagram

    - Sequence diagram

    ii. Draw the Data Flow Diagram (DFD)

4. **Implementation:**

    Implement the project using VB .NET as front end and SQL Server as back end.

5. **Testing:**

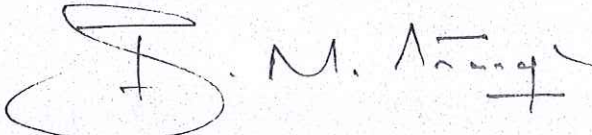   Prepare test plan and develop test case.

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QUESTION PAPER PATTERN

PROGRAM 1	Program 1 should be implementation of the software engineering activity for the Student Mark Analysis System or the Payroll Processing System.
PROGRAM 2	Program 2 should be any one of the following software engineering activities for the application mentioned in the program 1 1. Problem Analysis and Project Planning 2. Requirement Analysis 3. Design using UML diagrams 4. Design using DFD 5. Testing

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